

## Installation Guide





## *PoleVault Systems*

Installation Guide for the PVS 200, 300, and 400

# Precautions

## Safety Instructions • English

- 


This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.
- 


This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

### Caution

- Read Instructions** • Read and understand all safety and operating instructions before using the equipment.
- Retain Instructions** • The safety instructions should be kept for future reference.
- Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.
- Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français

- 


Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).
- 


Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

- Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.
- Conservser les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.
- Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.
- Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch

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Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.
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Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

- Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.
- Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.
- Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.
- Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español

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Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.
- 


Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaucion

- Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.
- Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.
- Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.
- Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

## 安全须知 • 中文

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这个符号提示用户该设备用户手册中有重要的操作和维护说明。
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这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

### 注意

- 阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。
- 保存说明书** • 用户应保存安全说明书以备将来使用。
- 遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。
- 避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

### Warning

- Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.
- Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).
- Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.
- Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.
- Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.
- Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

### Avertissement

- Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.
- Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.
- Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.
- Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.
- Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.
- Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un ype équivalent recommandé par le constructeur. Mettre au reut les batteries usagées conformément aux instructions du fabricant.

### Vorsicht

- Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.
- Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.
- Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.
- Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.
- Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.
- Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

### Advertencia

- Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.
- Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.
- Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.
- Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.
- Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.
- Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

### 警告

- 电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。
- 拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。
- 电源线保护** • 妥善布线，避免被踩踏，或重物挤压。
- 维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。
- 通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。
- 锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

# Introduction

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## FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

## Overview

This manual covers the installation of the **Extron PoleVault™ System** in a drop ceiling room with a wood or concrete structural ceiling. If the location has a concrete or beam style ceiling, alternative ceiling mounts can be obtained separately from Extron (see 2c, "Optional items", later in this chapter). For those types of installation, refer to the individual mounting hardware user's manuals for method.

It is assumed that the installer has some knowledge and experience of A/V, electrical, or electronic device installation. This manual guides the A/V installer through the steps for installation and connection of each of the system's component parts.

It may be that the locations for the devices (e.g., wall plates, projector, and screen) have been pre-determined. However, some room installation examples are given to help in installations where final location is yet to be determined.

## The PoleVault System

Extron PoleVault Systems are easy-to-use, network-enabled, all-inclusive packages, making them ideal for single-projector K-12 classrooms. PoleVault Systems use economical twisted pair cables for transmitting signals and include network connectivity for Web-based asset management, monitoring, and control.

**NOTE** *The hardware and devices listed on the inventory pages have individual user manuals which have detailed safety information, installation, set-up, and configuration instructions, and should be referred to as needed.*

*For operation and set up of the projector, screen, and input devices, refer to the relevant manufacturer's manuals supplied with those devices.*



- ⑧ Projector power cord - not included
- ⑨ UTP network cable - not included

# Extron PoleVault™ System

## ***PoleVault System installation and wiring overview***



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## Before you Begin Installation - Planning

Before installation is started, several major factors must be considered to ensure that the overall installation is as smooth and trouble free as possible, and that the final finished project meets the needs of the customers, users, audiences, and installer.

The installation consideration on the following pages, though not comprehensive, should be consulted to help ensure that key aspects have been considered.

### 1. Room layout

#### a. The room

The application diagram below shows a typical classroom installation.



#### **Typical classroom installation**

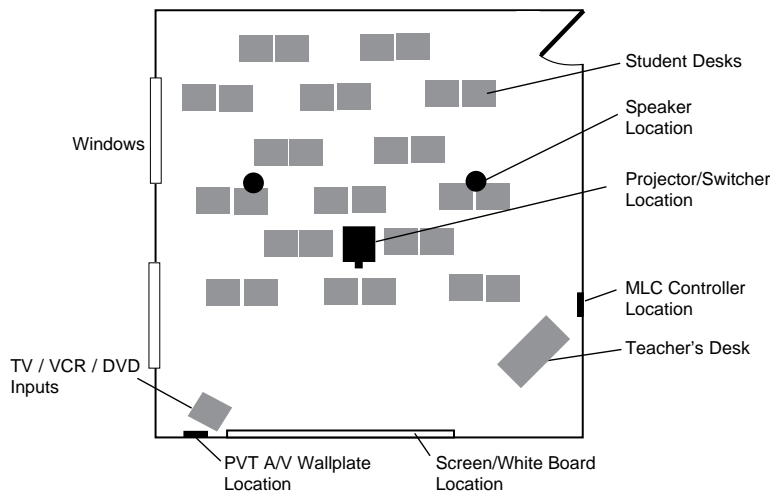
Room factors to be considered should include, but are not confined to:

- Room size, orientation, and layout:
  - Audience factors (e.g. number, ADA requirements, seating arrangements)
  - Existing installed furniture (bookcases, racks, cabinets, workbenches, sinks, etc.)
  - Windows, doors, and support pillar locations in relationship to the proposed screen location
- Ceiling and wall type (important in assessing the installation hardware needed)
  - Ceiling type: dropped, spline, hard lid etc., structural type (wood, concrete, trusses), plenum or non-plenum
  - Wall type: drywall, cement, brick etc.

**WARNING** Check the structural ceiling to ensure that it can handle a load four times the weight of the final setup.

## Introduction — Planning, cont'd

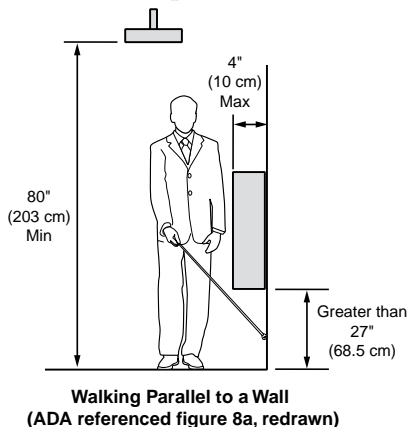
- Lighting
  - Type and control (important for projector image viewing)
  - Ambient light from windows



### Example classroom installation

#### b. Location of the screen and projector

- Proposed screen location
  - Normally located at the front center of the room (not covering fire alarm strobes when screen is lowered)
  - Dimensions and type of screen (maximum image size, motorized or hanging screen)
- Proposed projector location
  - Aligned with center of the screen. Not an obstruction to viewing
  - Projector's throw distance (maximum and minimum limits to screen) of the image
  - Horizontal offset (horizontal distance from the center of the lens to the center of the projector)
  - Vertical offset of the projected image (height relationship between the projector and the screen)
  - Projector angle (image projected up, down, or horizontal to screen)
  - Power source for the projector: existing and accessible or needing installation
  - Projector weight. The Universal Projector Bracket (UPB 25) supports a maximum weight of 25 lbs.
  - Overhead clearances (refer to a copy of "ADA Standards for Accessible Design", "Section 4-4", "Head Room" for ADA requirements)

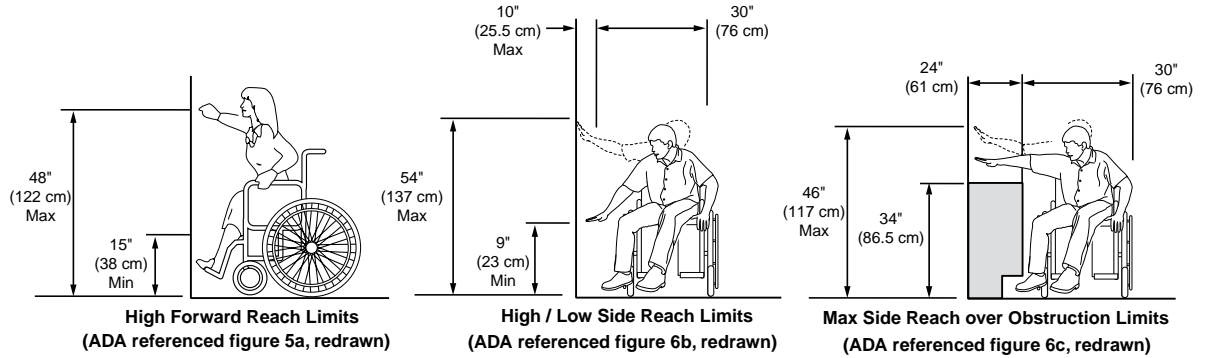


### ADA overhead and side clearance requirements

- Viewing obstructions
  - Pillars, furniture etc., window locations for glare reduction, obstructions between projector and screen

### c. Location of MediaLink Controller and Wall Plates

- Forward and side reach (for full details refer to a copy of "ADA Standards for Accessible Design", "Section 4-2", "Space Allowance and Reach Ranges")

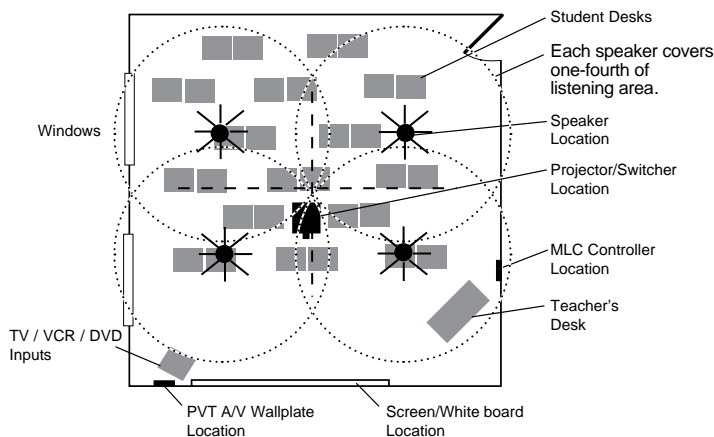


### ADA high/low forward, side and over obstruction reach limit requirements

- Location of source devices
  - Desk, table, or rack mounted, proximity to proposed transmitter location (wall, podium, or furniture)
- Cabling obstacles
  - Studs, utility pipes, power supply location (raceway installation needed?)
- Network drop for MediaLink Controller
  - Wall or floor cabled

### d. Type and location of the speakers

- Speaker type based on room ceiling and wall type
- Total number and spacing of speakers
  - Based on ceiling height and room size
- Audience seating and room acoustics
  - Desired evenness of sound coverage and ambient noise level compensation



### Example classroom with four speaker installation

# Introduction — Inventory Overview










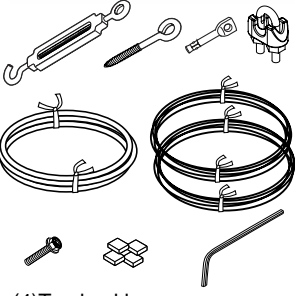
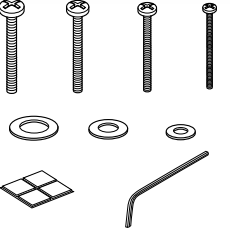
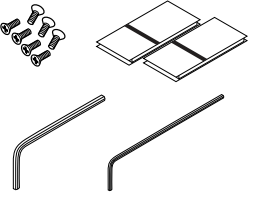
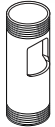





## 2. Inventory

### a. Included items

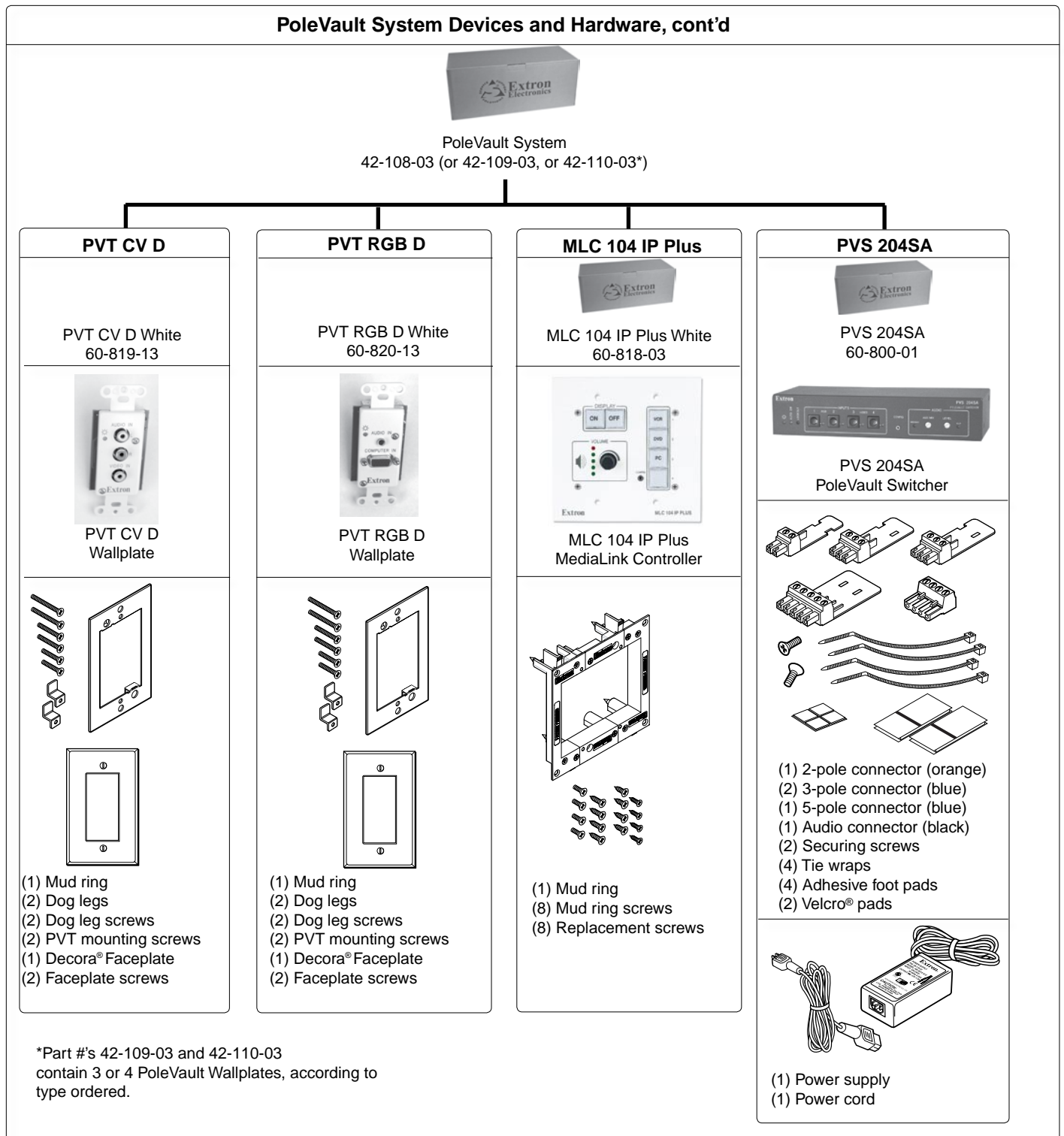
The PoleVault System (PVS xxx) ships in two boxes. The larger box (42-1xx-xx) contain the devices and hardware, individually boxed and labeled. The smaller box (42-103-13) contains only the PV SI 3C LP speakers. Each PVS system has the same quantities of speakers, hardware and devices, but differ in the number and type of PoleVault A/V Source Input Wall Plates, and are shipped as follows:

- PVS 200 (part # 42-108-03) includes one PVT RGB D and one PVT CV D
- PVS 300 (part # 42-109-03) includes two PVT RGB D and one PVT CV D
- PVS 400 (part # 42-110-03) includes two PVT RGB D and two PVT CV D (see front cover of this manual)

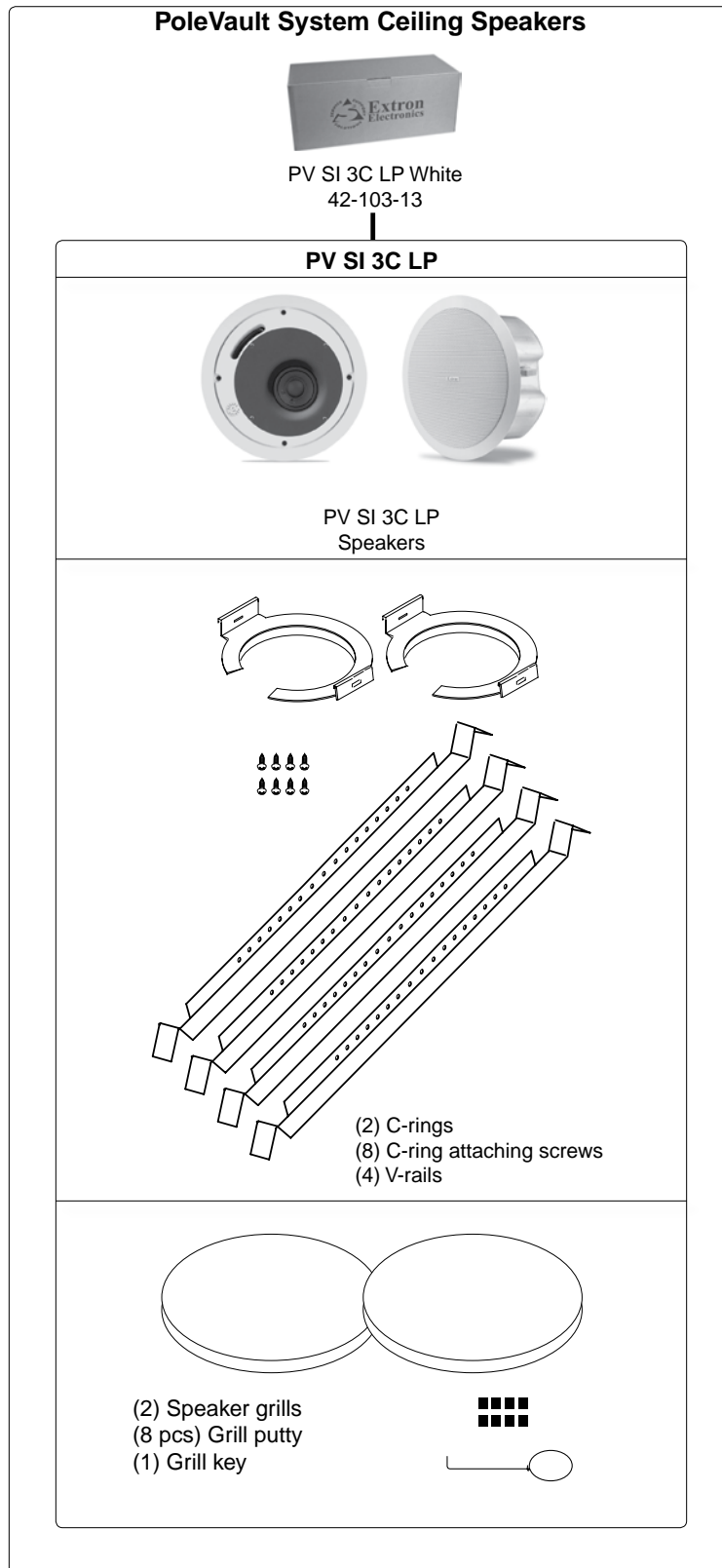
Carefully check all the received items against the following lists.

PoleVault System Devices and Hardware				
<div> PoleVault System 42-108-03 (or 42-109-03, or 42-110-03*)</div>				
<div><b>PCM 240</b>  PCM 240 White 60-772-03</div>	<div><b>UPB 25</b>  UPB 25 White 60-773-03</div>	<div><b>PMK 450</b>  PMK 450 White 70-618-03</div>	<div> <b>PMP</b> PMP 6 White 70-511-13</div>	
<div> PCM 240 Projector Ceiling Mount</div>	<div> UPB 25 Universal Projector Bracket</div>	<div> PMK 450 Pole Mount Kit</div>	<div> <b>CABLES</b> (1) SPK 18, 25'</div>	
<div> (4) Turnbuckles (5) Lag eyes screws (5) Concrete anchors (2) Cable clamps, Gal Steel (1) Safety wire (15 ft 1/8" dia) (2) Tie wire (30 ft, 14 AWG) (4) Locking Screws (4) Adhesive pads (1) Hex key</div>	<div> (4) M6 x 40 mm screws (4) M5 x 40 mm screws (4) M4 x 40 mm screws (4) M3 x 40 mm screws 0.328 ID washers (4) #10 washers (4) #6 washers (4) Adhesive pads (4) Hex key (1)</div>	<div> (7) Replacement screws (2) Velcro™ pads (1) Set screw Hex wrench (1) Security screw Hex wrench</div>	<div> PMP Projector Mounting Pole</div>	
			<div> (1) MVGA M-M, 3'</div>	
			<div> (1) V RCA, 3'</div>	
			<div> (1) MLC, PW/RS232/VC, 50'</div>	
			<div> (1) IR SERIAL COMM, 50'</div>	
			<div> CAT5 T568A Patch, 50' Quantity varies depending on PVS system ordered.  These may be boxed separately or loose inside larger box.</div>	

## PoleVault System Devices and Hardware, (cont'd)



## Introduction — Inventory Overview, cont'd



**NOTE** If any items in the PoleVault System boxes are damaged or missing, contact the Extron Technical Hotline (see rear cover for contact numbers).

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## **b. Items not included**

The following items are not included. However, input and display devices are essential parts of the system, and at any installation they may vary depending on their use. This list suggests various devices that may be used.

- Projector (or display device)
- Screen (and mounting hardware)
- Input devices, such as:
  - DVD/CD/VCR combo player (and cables)
  - Document camera (and cables)
  - PC or Mac (with keyboard, mouse, local monitor, VGA cables, RJ-45 network cables, power cords, and, where desired, a P/2 DA2 or DA for PC signal to local monitor and projector)
- Installation hardware needed (may vary per installation):
  - Bolts for concrete structural ceilings where needed
  - Toggles (used for screen mounting on dry wall)
  - S-hooks for hanging the screen
  - Spare ceiling tiles in case of accidental damage during installation
  - Electrical box, where installation of a box on the PCM 240 is desired
  - Safety wire, lag eye bolts, and strain reliefs for installation and securing ceiling speakers
  - Heat shrink, extension cord

## **c. Optional items**

The optional items suggested below can be added to or substituted for items in the standard PoleVault System.

- Optional accessories:
  - MLP 101 D (mic to line pre-amplifier)
  - Wall mount speakers (e.g., SI 26) or extra ceiling speakers
  - MLC 104 IP Plus DV+ controller (includes DVD/VCR IR control)
  - MLC 104 IP Plus L controller (with lectern faceplate)
  - MLC 104 IP Plus AAP controller (with AAP opening)
  - PPC 25 Priority Page Controller
  - P/2 DA2
- Optional installation hardware:
  - FCMP (flat ceiling mount)
  - ACMP (angled ceiling mount)
  - SMB (surface mount boxes for installing the MLC on a podium or desk)
  - EWB (external wall boxes to mount devices for a surface raceway system)
  - MLM-WB+ (lockable metal wall box with flip-down 4U rack space)
- Optional A/V source inputs:
  - PVT CV AAP (composite video architectural adapter plate model)
  - PVT RGB AAP (RGB architectural adapter plate model)
  - PVT RGB (RGB rack mount model)
  - PVT SW RGB (RGB rack mount model with switching capabilities)
  - PVT CV (composite video rack mount model)
  - PVT RGB CV (RGB and composite video rack mount model)
- Optional speakers:
  - SI 3 (Compact Full-Range Surface Mount Speakers)
  - SI 26X (Two-Way Open Back Ceiling Speakers)
  - SI 26W (Two-Way-In-Wall Speakers with 6.5" Woofer)
  - SI 28W (Two-Way-In-Wall Speakers with 8" Woofer)
  - SI 26CT (Two-Way Ceiling Speakers with 8" Back Can and Transformer)
  - SI 26 (Two-Way Surface Mount Speakers with 6.5" Woofer)

## Introduction — Inventory Overview, cont'd

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### d. Installation tools

To aid the professional installer, this checklist gives the tools recommended to complete the installation. Tools should include, but are not confined to:

- Laser level, or two levels (large for screen installation, small for wall plates and projector mounts)
- Tape measure
- Stud finder
- Drill and drill bit set including a Unibit to cut through metal studs
- Extension drill bit (3/4" min., 4 to 8 foot length, to drill through fire-breaks)
- Socket set
- Pipe strap or wrapped pipe wrench
- Lineman's pliers and wire strippers
- Standard screwdriver set and Tweaker
- Cable cutters (to cut safety wire)
- Dry wall saw and hacksaw blade mounted on handle (for cutting ceiling tiles)
- Flashlight and safety goggles
- Razor knife
- 2" hole saw
- Painter's tape (to mark up walls), pencil, and marker pen
- RJ-45 crimpers and RJ-45 connectors
- Voltage tester
- Fish tape, pull string, and electrical tape (for taping fish tape to pull string)
- Zip ties
- Vacuum cleaner
- Heat gun



# Installation Overview

This overview outlines the basic steps for installing the PoleVault System. Detailed description of these steps is given in five sections, Stages One through Five.

**NOTE** Additional installation hardware is needed and should be supplied by the installer. See Introduction, “Items not included”, for a list.  
Optional accessories may be desired for this installation. See Introduction, “Optional items”, for a list, or visit [www.extron.com](http://www.extron.com) for details.  
Refer to local building standards and codes to verify that the installation will meet all the regulatory requirements. Observe all local and national building and safety codes, UL requirements, and ADA Accessibility Guidelines. For details of the OSHPD approved method of installation (OPA-1782), consult the PCM 240 User’s Manual, 68-1180-01, Rev D.  
Refer to the specifications on pages 2-31 through 2-33 for system hardware weights and dimensions.

Carefully check inventory of PoleVault system packages, input and output devices, any optional accessories, and installation hardware before commencing.

## Outline of installation steps

### Stage One — Install the Screen and Projector.

- ☐ Mark the screen location (page 2-3).
- ☐ Install projector to verify location (page 2-3).
- ☐ Verify the image location (page 2-4).
- ☐ Cut the ceiling tile (page 2-5).
- ☐ Finish projector ceiling mount installation (page 2-5).
- ☐ Secure the projector ceiling mount to the ceiling (page 2-6).
- ☐ Install the screen (page 2-7).

### Stage Two — Install the A/V Source Input Wall Plates and MLC 104 IP Plus.

- ☐ Install the mud rings (page 2-10).
- ☐ Pull cables (page 2-11).
- ☐ Install the wall plates (page 2-12).
- ☐ Install the MediaLink Controller (page 2-13).

### Stage Three — Install the PV SI 3C LP Ceiling Speakers.

- ☐ Cut the ceiling tile (page 2-17).
- ☐ Install the speaker in the ceiling tile (page 2-17).
- ☐ Secure the speakers to the structural ceiling (page 2-18).
- ☐ Cable the speakers (page 2-18).
- ☐ Finish speaker installation (page 2-20).

### Stage Four — Install the PMK 450 and the PVS 204SA.

- ☐ Pull the cables (page 2-22).
- ☐ Install the PMK 450 pole mount kit (page 2-22).
- ☐ Install the PVS 204SA switcher (page 2-23).
- ☐ Finish installing the pole mount kit (page 2-24).

### Stage Five — Configuring the system.

- ☐ Configure the system (page 2-26).
- ☐ Test the system (page 2-28).
- ☐ Final installation (page 2-29).

Where possible in the following pages, line drawings and photos from an actual installation are used to clarify some of the steps discussed in the text. Each image has a number corresponding to the particular step (e.g., 3a) described.

# Stage One — Install the Screen and Projector

# Stage 1

This stage involves installing the three pieces of hardware shown below.

**PCM 240 Projector Ceiling Mount**

1-gang and 2-gang Accessory Mounting Points (e.g. power sockets)

Pipe Adapter

Pipe Adapter Set Screws (2)

T-bar Securing Screws (4)

Pipe Adapter Plate Lock Nuts (4)

**Where it goes:** Attaches to structural ceiling, rests on suspended ceiling.

**What it does:** Holds PMP, Pole Mount Kit (see Stage 4), and projector.

**PMP Projector Mounting Pole**

Threaded at both ends

Cable Access Cutout (install this end uppermost)

**Where it goes:** Screws up into PCM 240.

**What it does:** Holds Pole Mount Kit and projector.

**UPB 25 Universal Projector Bracket (shown separated into the two sections)**

**Adjuster Plate (Top Section)**

Set Screws (2)

Horizontal Angle Adjustment Screws (4)

Pivot Point screws (4)

Vertical Angle Adjustment Screws (4)

Pivot Point Screw

Security Flange (on rear)

**Projector Bracket (Bottom Section)**

Adjuster Plate Locking Screws (4)

Projector Securing Screw

Threaded Barrels (4)

Arm Adjustment Screws (4)

Security Flange (on rear)

360° Movement

**Where it goes:** Adjuster plate screws onto base of PMP, and projector bracket attaches to projector.

**What it does:** Attaches projector to PMP. Allows projector orientation to be adjusted in three planes.

## 1. Mark screen location

- a. Mark the center line and the outer edges of screen.

**TIP** When marking the location of screens, devices, or site for installing transmitters and MediaLink control devices, use painters' tape to avoid wall surface damage.

When marking the center line of the screen, where possible, keep it aligned with the center of the ceiling tile. This makes the projector installation and alignment easier.

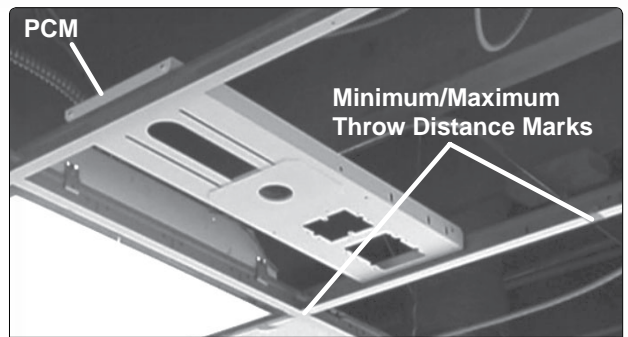
- b. Mark any structural studs, utility pipes, conduits, or fire-breaks before drilling the hardware holes. Do not drill the holes at this time.



**1a Mark the screen location**

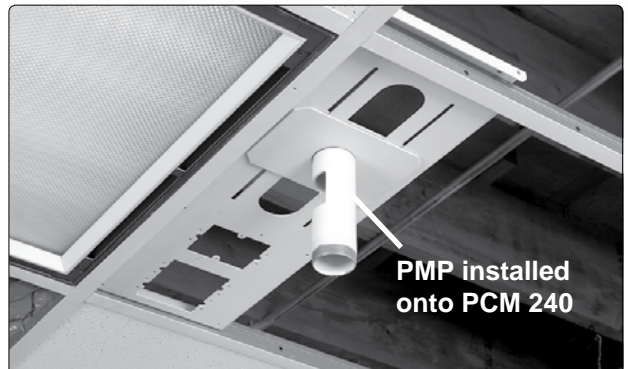
## 2. Install projector to verify location

- a. Remove the ceiling tiles, and mark the maximum and minimum throw distances on the T-frame.
- b. Place the PCM 240 over the T-frame, between the two marks. Lightly tighten the frame screws.



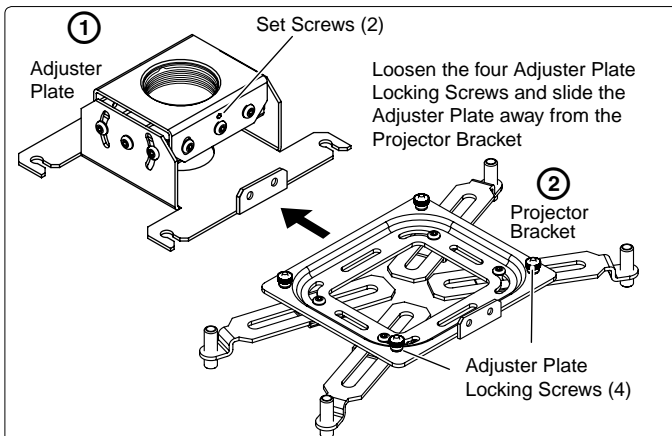
**2b Place the PCM 240 on the T-bar**

- c. Back out the set screws on the PCM 240 adapter plate and screw the PMP into the pipe adapter, with the cable access hole closest to the ceiling. Turn it so the cable access hole faces away from the screen. Tighten the set screws.



**2c Install the PMP**

- d. Back out the set screws on the top portion (the adjuster plate, see ① below) of the UPB 25, and screw the plate onto the base of the PMP. Align it so the security flange is at the rear. Tighten the set screw.

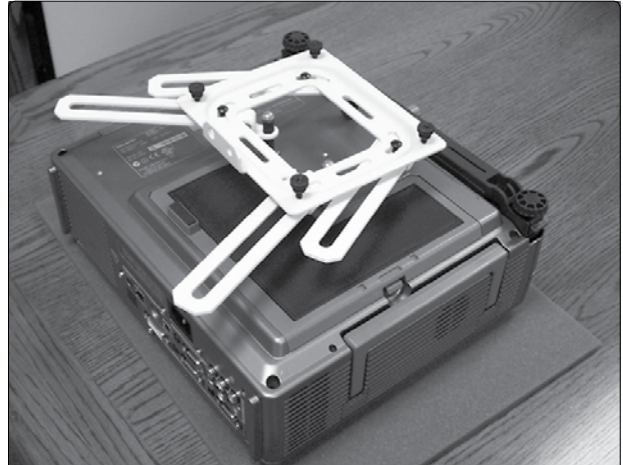


**2d Screw the adjuster plate onto the PMP**

## Installation — Stage One, cont'd

- e. Using suitable screws, mount the projector onto the lower portion of the UPB 25 (the projector bracket, see ② in step 2d's drawing). Align it so the security flange is at the rear. A minimum of three arms need to be attached to the projector. Adjust the arms to fit as needed. Lock down the arm adjustment screws.

**TIP** Adjust the threaded barrels at the end of each arm to keep the bracket level.



②e **Attach the bracket to the projector**

- f. Lift the projector up to the mount plate and slide it into place. Tighten down the locking and pivot screws.



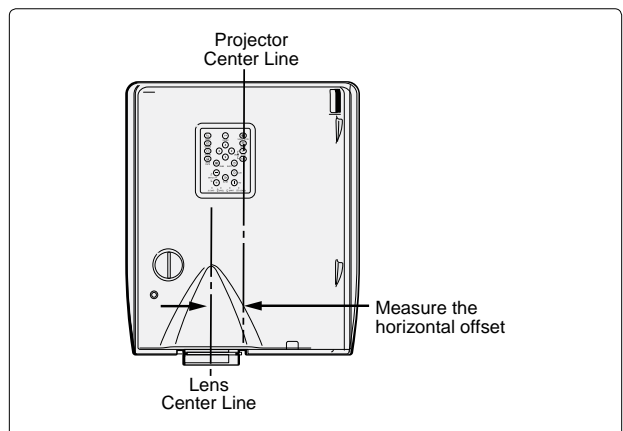
②f **Slide and lock the projector onto the adjuster plate**

### 3. Verify the image location

- a. Connect a power cable to the projector and turn it on.
- b. Verify image size and location by loosening the PCM 240 adapter plate locking nuts, and adjust the plate (left-right) to center the image.

**TIP** Remember to include the vertical and horizontal offsets when aligning the projector. Refer to the projector manual for information.

- c. When satisfied lock down the plate locking nuts.



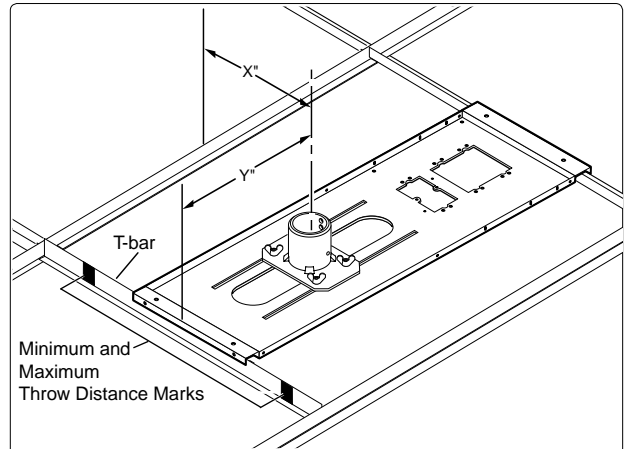
**TIP** **Horizontal offset**

## 4. Cut the ceiling tile

- a. Mark the location of the PCM 240 on the T-bar, before removing it. This aids putting it back in the correct location when the tile is replaced.

**TIP** Mark the screen direction on back of the tile (e.g. with an arrow or "to front") to help orientation of tile when replacing it after cutting.

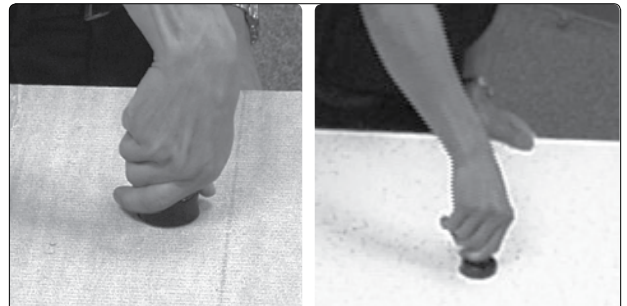
- b. Measure the distances X and Y (see figure) from the inner vertical section of the front and left T-bar runners to the center of the Pipe Adapter Plate.



**4b Take measurements with the PCM 240 on the T-bar**

- c. Using these dimensions, mark and cut a hole for the PMP in the ceiling tile.

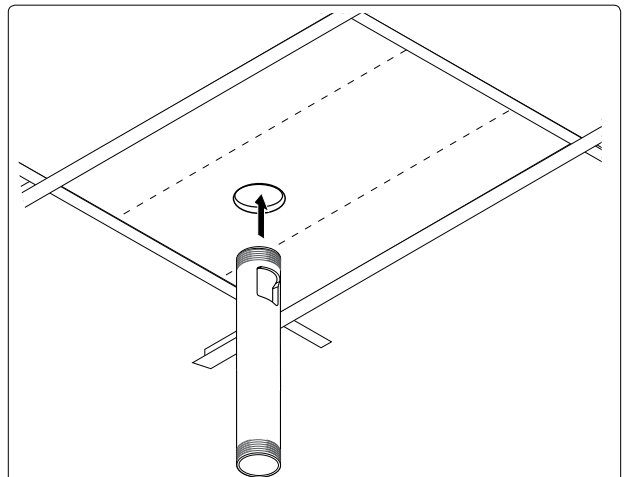
**TIP** Place the tile on a box, mark hole center on the underside of the tile. Use a hole saw bit to start to cut the hole by hand (turning bit counter clockwise) to avoid damaging the tile. When the drill bit is through the tile, turn the tile over and finish cutting from the top side.



**4c Mark and start cutting the hole on the underside. Finish on the top side.**

## 5. Finish Projector Ceiling Mount installation

- a. Loosen the set screws and unscrew the UPB 25 from the mounting pole. Do not remove the projector bracket from the projector.
- b. Loosen the PCM 240's set screw and remove the mounting pole, then remove the PCM 240.
- c. Replace the cut ceiling tile, checking the orientation to align the hole with the PCM 240.
- d. Replace the PCM 240 over the ceiling tile and screw the mounting pole (with the access hole uppermost) up through the hole into the mounting plate. Tighten the set screws.



**5d Screw the PMP into the mounting plate (viewed from below)**



## Installation — Stage One, cont'd

### 6. Secure the Projector Ceiling Mount to the ceiling

- a. Attach the four turnbuckles to the mounting plate, one at each corner.

**CAUTION** *DO NOT rest or lean on the mounting plate or suspended ceiling when attaching turnbuckles, tie wire, or when drilling into the ceiling*

**NOTE** *For safest installation, insert the turnbuckle from the outside so that it hooks inwards.*



**6a Attach turnbuckles at the corners**

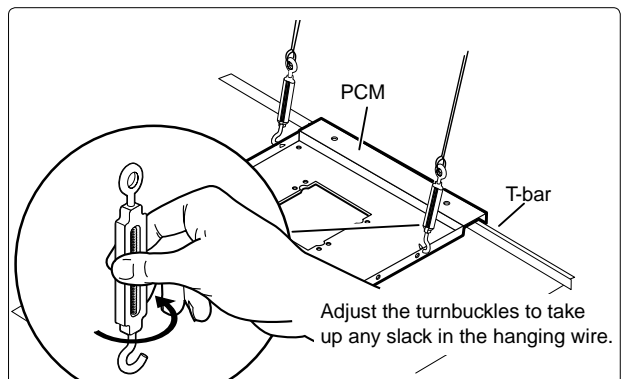
- b. Mark and drill holes at 10 degrees out from vertical. Drill a fifth hole directly centered above the PCM 240 for the safety cable.
- c. Install appropriate anchors or lag eye-bolts for the structural ceiling into each drilled hole
- d. Cut four equal lengths of the supplied hanging wire, and loop the wire through the anchors or eye screws, and the turnbuckles, then twist the wire around itself at least five times tightly.



**6b Mark structural ceiling for lag bolt installation**

- e. Hand tighten the turnbuckles, and level the plate so it just rests on the grid.

**CAUTION** *The four hanging wires should be taut, taking the full weight of the completed installation. Do not overtighten the turnbuckles or the T-bar assembly could be lifted, making the suspended ceiling bowed and unsafe.*

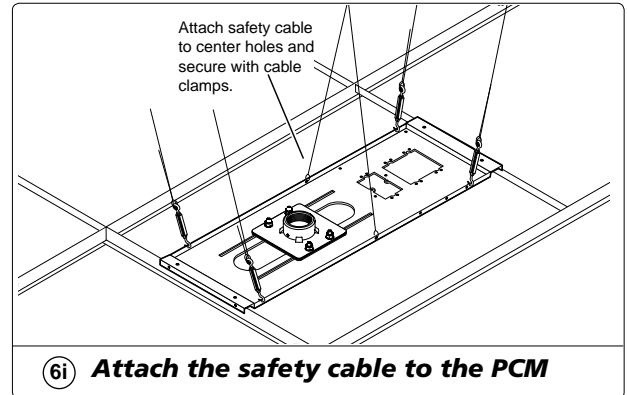


**6e Tighten the turnbuckles**

- f. Tighten the four T-bar securing screws on the PCM 240.
- g. Mark a point in the ceiling directly above the plate's center, drill a hole and install a ceiling anchor or eye screw

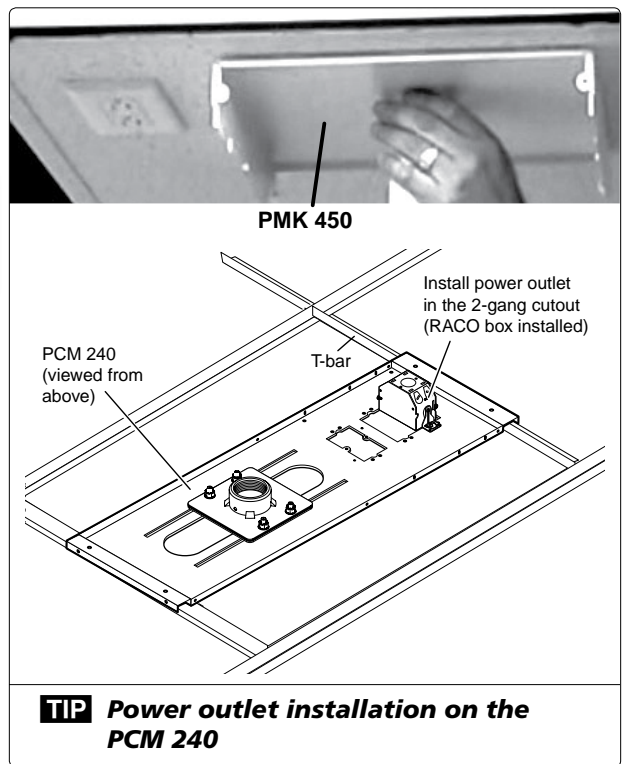
**CAUTION** *DO NOT rest or lean on the plate or suspended ceiling grid during installation of safety cable, or during installation and wiring of electrical boxes, accessories, and projector.*

- h. Pass the safety cable through the anchor and attach it to the center holes on either side of the plate. Ensure the cable is of equal length on both sides of the anchor and secure the cable using the cable clamps.



**TIP** Install any optional power outlets in the 2 gang opening on the mounting plate, towards the outside edge of the mount, so it does not interfere with the PMK 450 when installed.

**CAUTION** For safety, all wiring of the electrical boxes and accessories should be completed after the plate is fully installed and secure.



## 7. Install the Screen

- a. Following the screen manufacturers guidelines, continue to install the screen mounting brackets and then hang the screen.

**TIP** Use S-hooks to hang the screen from the brackets.

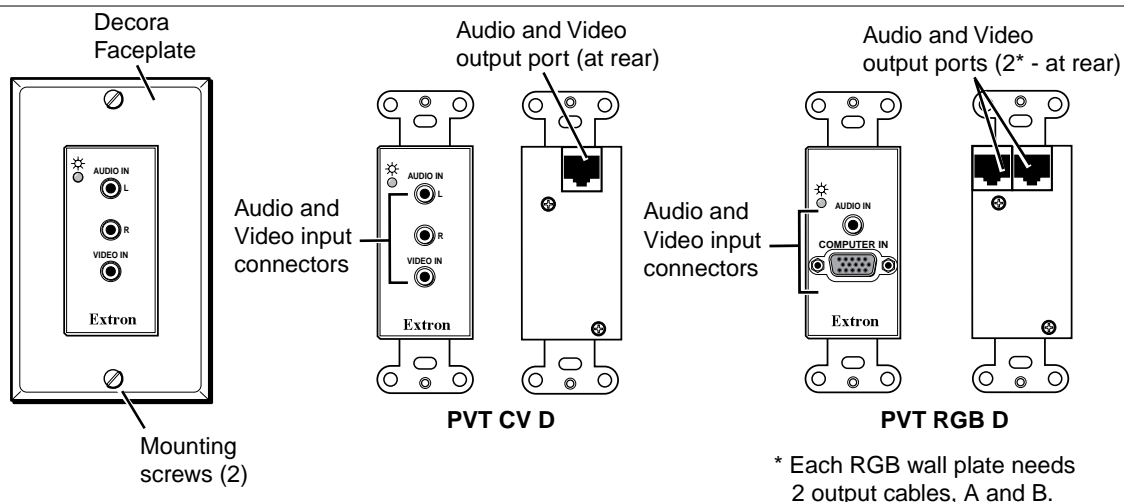
*Bend the ends of the S-hooks so the screen does not fall when it is rolled up.*

## Stage Two — Install the Wall Plates and MLC 104 IP

# Stage 2

This stage involves installing the devices shown below.

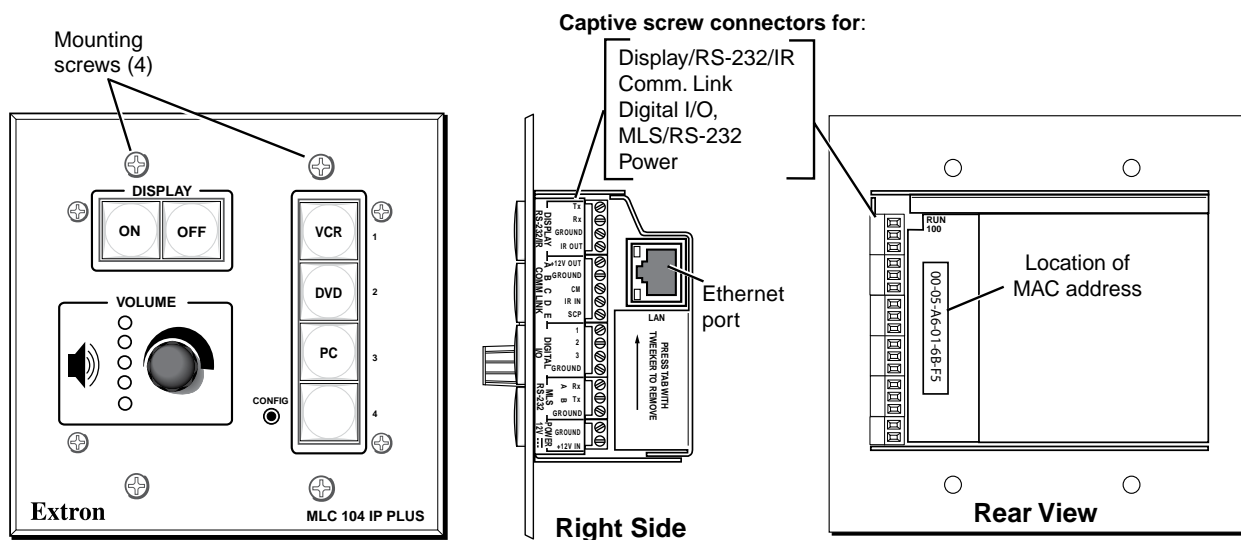
### PVT CV D and PVT RGB D PoleVault A/V Source Input Wall Plates



**Where it goes:** Installs in a wall near input location.

**What it does:** Transmits an input's composite or RGB video and audio signals to the switcher.

### MLC 104 IP Plus MediaLink Controller



**Where it goes:** Installs in a wall at a location convenient to user.

**What it does:** Provides remote control of switcher and projector.



## Cables

### PVT transmitter installation

- CAT 5 T568A signal transmission cables (connects PVT's to PVS 204SA switcher)



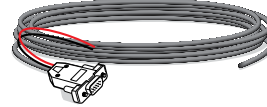
CAT5 Patch, 50'

### MLC 104 IP Plus installation

- MLC power and RS-232 control cable (connects the MLC to the MLC/Power control port on the PVS 204SA switcher)
- IR/RS-232 communications cable control cable (connects the MLC to the projector via RS-232 or to an IR emitter)
- LAN network cables (not supplied - connects the MLC to LAN)



MLC, PW/RS-232/VC, 50'



IR SERIAL COMM, 50'

# Stage Two — Install the Wallplates and MLC 104 IP Plus

**NOTE** The installation must conform to national and local electrical codes, and UL requirements. Refer to the devices' user manuals for details.

## 1. Install mud rings

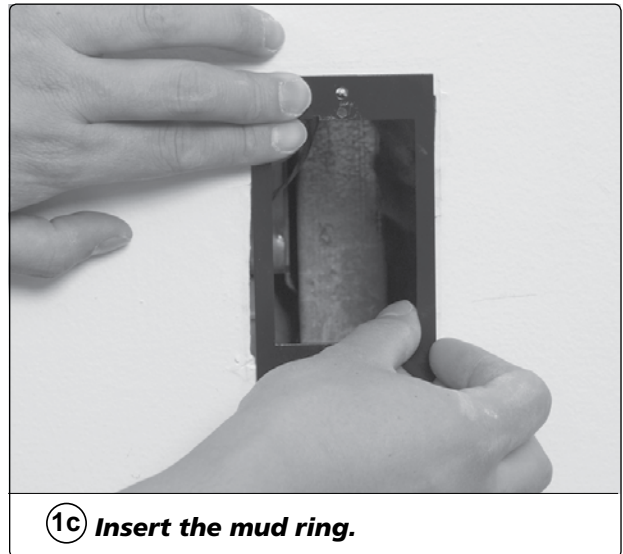
**NOTE** These devices can be installed using the supplied mud ring or a wall box. If installing a box, allow enough depth for the plate, and the cables. The box should be at least 2.5" (6.4 cm) deep to accommodate the connectors and cables. If a suitable wall box is already installed, follow step 2 onwards.

- a. Mark the holes for the mud rings.

**TIP** Use a level when marking the holes.

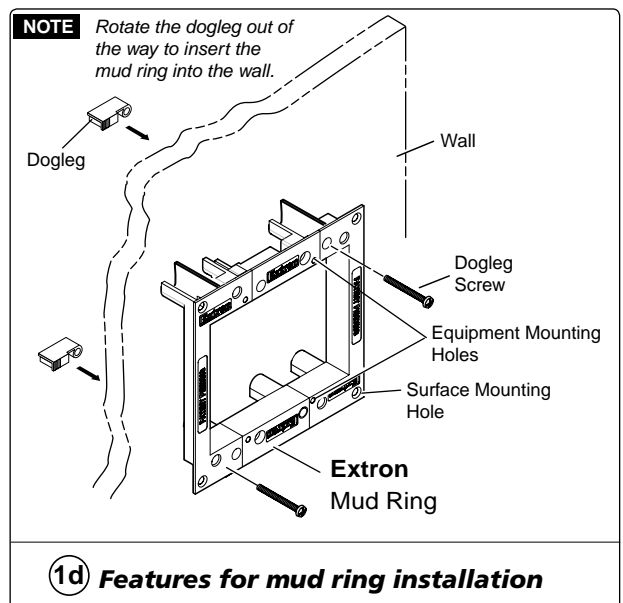
- b. Cut out the material from the marked area.
- c. Insert the mud ring into the opening. The mud ring's rear connectors should fit easily into the opening. Bend over the mud ring doglegs and secure with the screws provided.

Repeat steps a to c for all the transmitters needing to be installed.



**1c** Insert the mud ring.

- d. At the desired location repeat steps a to c for the larger MLC 104 IP Plus mud ring



## 2. Pull cables

The following cables need to be installed:

- CAT 5 cables for signal transmission from the A/V Wall plates to the PVS 204SA.

**NOTE** For PVT RGB D Wall plates, two CAT 5 signal cables for each input are needed.

Maximum distance from the PVS 204SA to the Wall plates is 100 feet. **The optimum distance is between 50 and 75 feet.**

The CAT 5 cables supplied are terminated to the **TIA 568A** standard. Other CAT 5 cables can be used if they are TIA 568A or 568B standards and terminated to the same standard at both ends.

- CAT 5 cables for MLC network connection
  - PoleVault switcher communication cable from the MediaLink controller
  - Projector communication cables from the MediaLink controller.
- Drill cable pathways through any obstructions (e.g., wall caps, fire-breaks, or horizontal studs).
  - Label the CAT 5 signal cables at both ends with the supplied labels. Refer to the *PVS 204SA User's Manual* for labeling details.

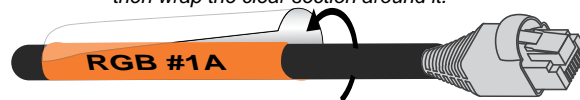
- Pull the cabling through the wall from the ceiling space down to the location of the transmitters and other wall devices, and out through the openings.

**TIP** Secure cables with cable clamps to provide strain relief.

Trim back the outer foil shield to the point where the cable exits the cable clamp, and insulate exposed cable shields with heat shrink to reduce the chance of short circuits.

Both braided and foil shields should be connected to an equipment ground at the other end of the cable.

**NOTE** Fasten the colored section to the cable first, then wrap the clear section around it.



**2b) Use the supplied labels for clear cable identification during installation.**

Signal Cable	Label color
RGB 1A (Input 1 RGB)	Orange
RGB 1 B (Input 1 RGB)	Orange w/black stripe
RGB 2A (Input 2 RGB)	Yellow
RGB 2B (Input 2 RGB)	Yellow w/black stripe
Video 3 (Input 3 Composite Vid)	Green
Video 4 (Input 1 Composite Vid)	Red

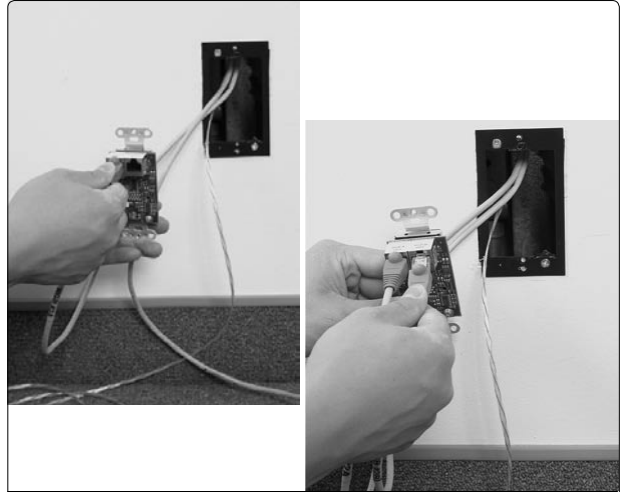


**2c) Pull the cables at each location.**

## Installation — Stage Two, cont'd

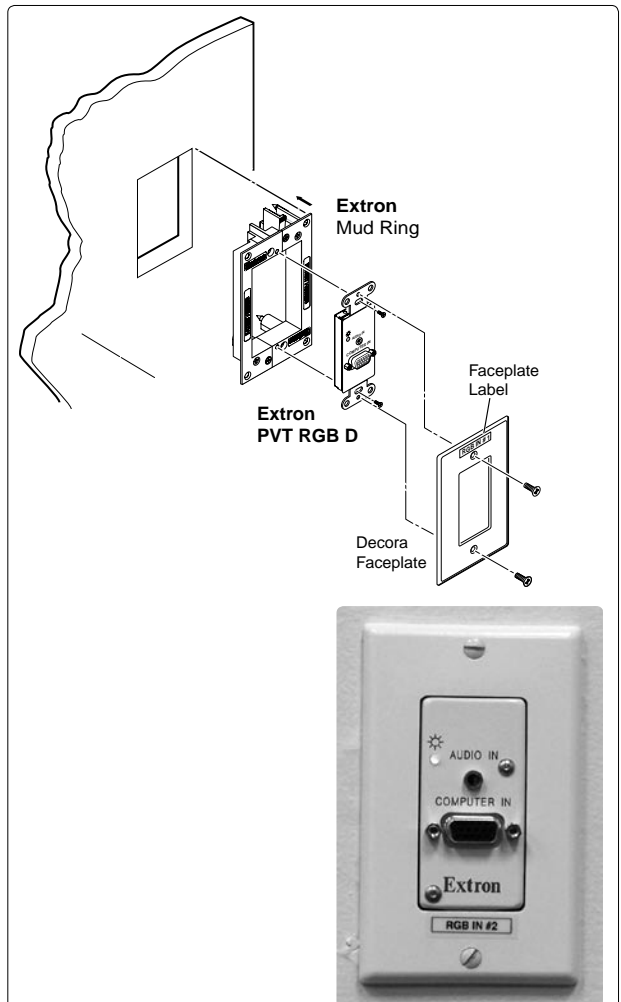
### 3. Install wall plates

- a. Connect the CAT 5 cables to the rear of the input devices (for RGB devices, cable labeled A to port A, cable B to port B).



**3a** Connect the cables to the A/V source input devices at each location.

- b. Mount each device into the mud ring.
- c. Attach the supplied Decora faceplate.
- d. Label the Decora plate with the supplied label, using the appropriate input number. This makes inputs easier to identify when configuring the switcher.
- e. Repeat steps a-d for other wall plates.



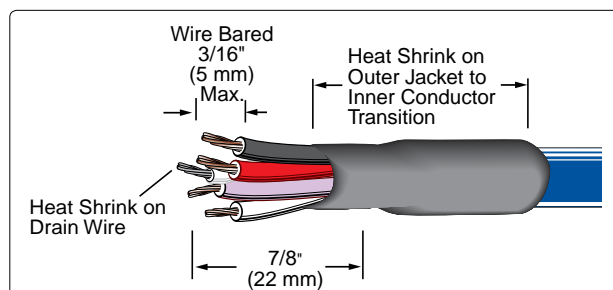
**3b** Mount the PVT in the mud ring, then attach **3c** and label **3d** the Decora faceplate.

## 4. Install MediaLink Controller

**TIP** Before cabling and installing the MLC 104 IP Plus, locate and write down the MAC address of the device for configuring the IP address. The 12 character alphanumeric address (e.g., 00-05-A6-03-9G-H4) can be found on a label on the rear of the controller.

**TIP** The length of exposed wire is critical to avoid transmission problems. Ensure the lengths given here are adhered to when stripping the cables for connection.

**NOTE** *If a drain wire is used, both ends of the wire must be covered by heat shrink to avoid accidental grounding.*

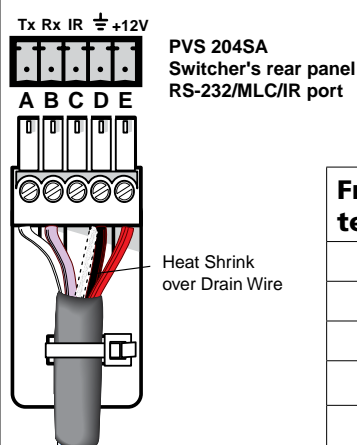


### **TIP** *Wire stripping lengths*

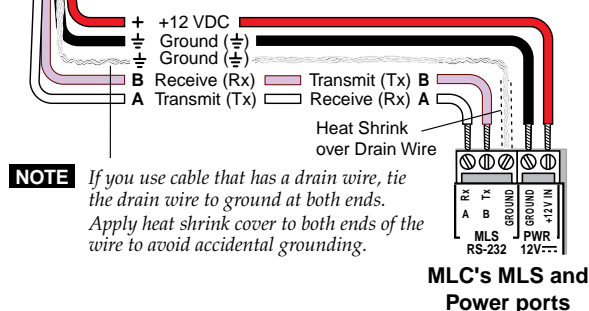
- a. Connect the MLC power and RS-232 control cable as shown.

**NOTE** *The MLC 104 IP Plus is powered from the PVS 204SA. DO NOT connect an external power supply to the MLC 104 IP Plus unless installing an optional secondary control panel.*

## RS-232/MLC/IR



From MLC 104 IP Plus terminal	Wire color	To PVS 204SA terminal
A - (Rx on the MLS port)	White	A - (Tx on the RS-232 port)
B - (Tx on the MLS port)	Violet	B - (Rx on the RS-232 port)
MLS RS-232 Ground	Drain wire	D - Ground $\frac{1}{2}$
Power Ground	Black	D - Ground $\frac{1}{2}$
12 V In	Red	E - +12 V



**NOTE** If you use cable that has a drain wire, tie the drain wire to ground at both ends. Apply heat shrink cover to both ends of the wire to avoid accidental grounding.

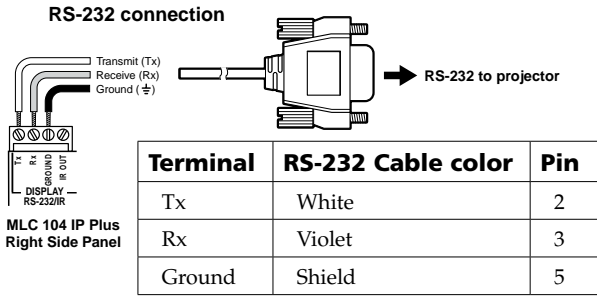
## MLC's MLS and Power ports

#### 4a) Connecting the MLC to the switcher

## Installation — Stage Two, cont'd

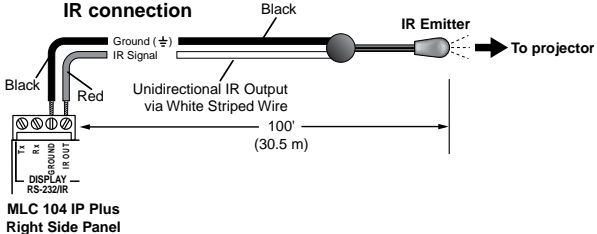
- b. Connect the IR/RS-232 projector communication cable as shown for either RS-232 or IR projector control.

**RS-232 connection**



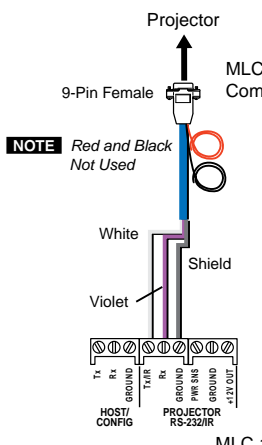
Terminal	RS-232 Cable color	Pin
Tx	White	2
Rx	Violet	3
Ground	Shield	5

**IR connection**

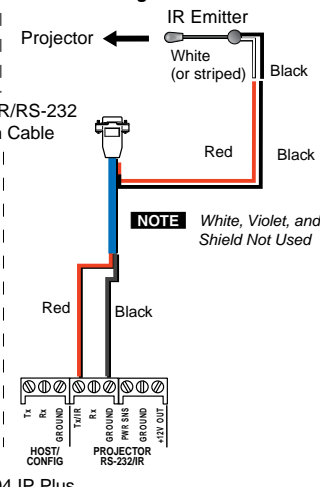


Terminal	IR/RS-232 Cable color	IR Cable color
Ground	Black	Black
IR Signal	Red	White/Black

**Connecting RS-232 Cable**



**Connecting IR Cable**



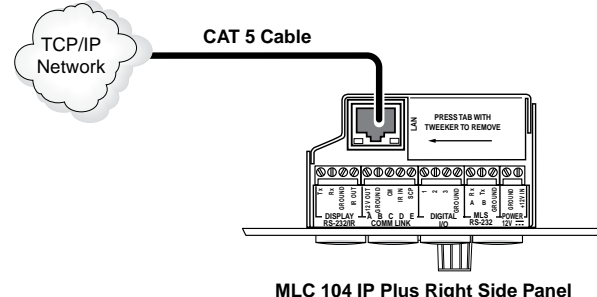
**NOTE** Red and Black Not Used

**NOTE** White, Violet, and Shield Not Used

**4b) Connect the MLC to the projector with an RS-232 cable or IR emitter cable, as appropriate.**

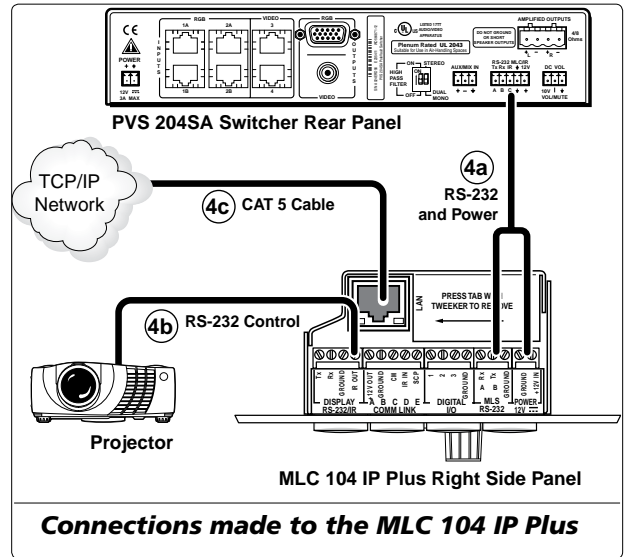
- c. Connect a CAT 5, 5e, or 6 straight through cable to the MLC's RJ-45 jack.

**WARNING** DO NOT connect the MLC's RJ-45 jack to the PVS 204SA twisted pair inputs.

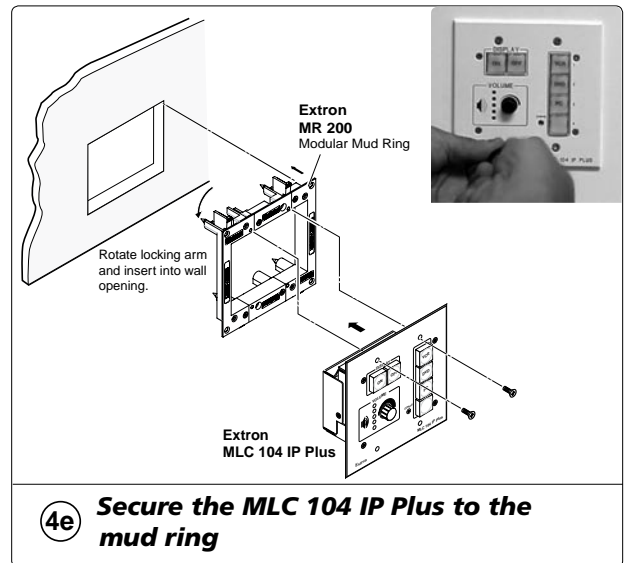


**4c) Connect to the LAN using a CAT 5 cable**

The connections between the MLC 104 IP Plus and the PVS 204SA switcher should look like this.



- e. Sliding the cables into the opening, secure the MLC 104 IP Plus to the mud ring with the provided machine screws



Stage Three — Install the PV SI 3C LP Ceiling Speakers

# Stage 3

This stage involves installing the devices shown below.

**PV SI 3C LP Ceiling Speakers**

Plenum Cover

PV SI 3C LP Speakers (2)

Seismic Tab

Doglegs (4)

Speaker Grills (2)

V-rails (4)

V-rails Tabs

C-Rings (2)

Fitting screws (8)


**Where it goes:** Installs in ceiling tiles at predetermined location for best acoustics. Connects to switcher.

**What it does:** Receives and outputs audio signal from PVS 204SA switcher

**Cables**

**Speaker Installation:**

- Speaker cable (connects ceiling speakers to the PVS 204SA switcher)



SPK 18, 25'



**NOTE** The installation must conform to national and local electrical codes, and UL requirements. Refer to the device's user manual for details.

## 1. Cut ceiling tile

If installing PV SI 3C LP speakers, do the following:

- Remove the ceiling tiles where the speakers are to be installed.

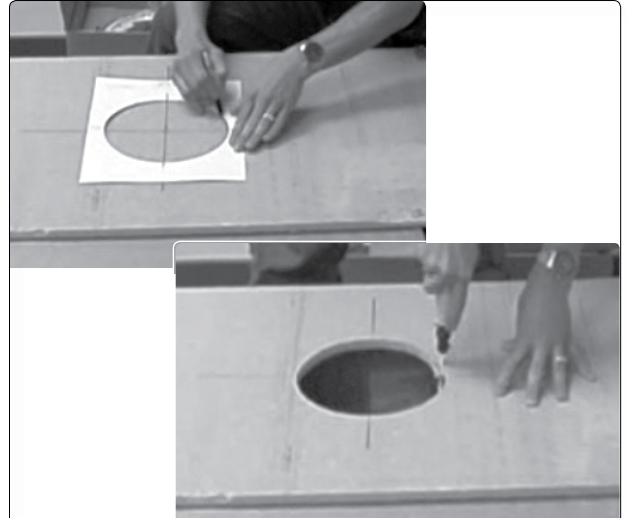
**TIP** For ease of working on the speaker when it is replaced on the T-bar, remove an adjacent tile(s).

- Locate the tile center, and using the supplied template, trace and cut the hole for the speaker.

**TIP** Place an empty box under the tile for support and to collect the waste.

Measure and mark the center point of the tile and align the cross marks with those on the supplied template.

Use a fine hacksaw blade to cut the tile without damaging the face.

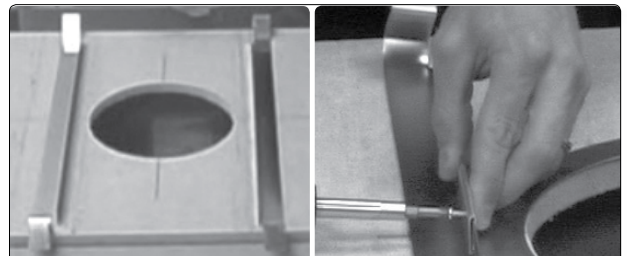


**1b Mark the tile and cut the hole**

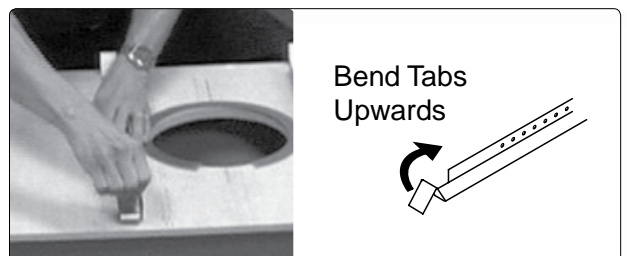
## 2. Install the speaker in the ceiling tile

- Lay two supplied speaker V-rails across the tile on either side of the hole.
- Remove the C-ring from the speakers and attach it to the center of the V-rails with the supplied hardware.

**TIP** At the ends of each V-rail, bend the tabs upwards. This makes it easier when replacing the tile back on the T-bars. When installation is complete, bend the V-tabs down onto the T-bars



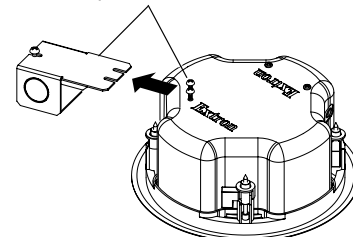
**2a Place the V-rails on either side of the hole, insert and 2b attach the C-ring**



**Bend the end tabs upwards.**

- Remove the plenum cover from the speaker terminals
- Insert the speaker into the ceiling tile from the face side.

Loosen the screws and remove the plenum cover.



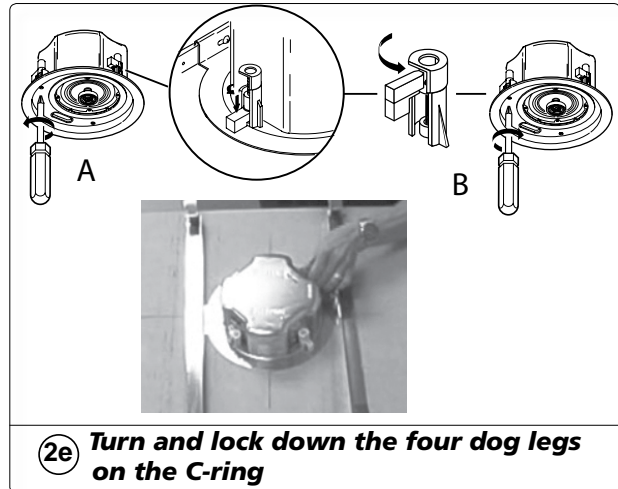
**2c Remove plenum cover**

## Installation — Stage Three, cont'd

- e. Loosen the four screws on the front baffle (counter clockwise) 1/2 turn (see figure, A) and turn the doglegs to lock onto the C-ring. Tighten down the front screws (see figure, B).

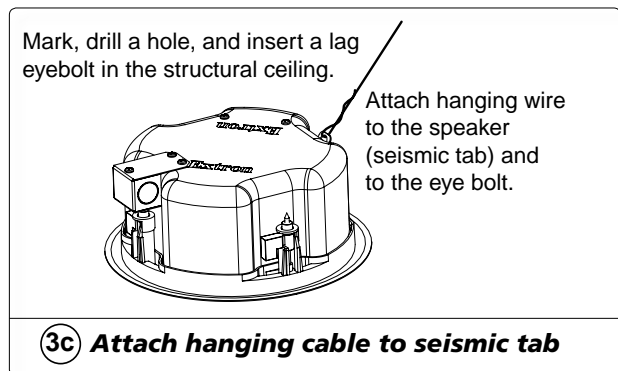
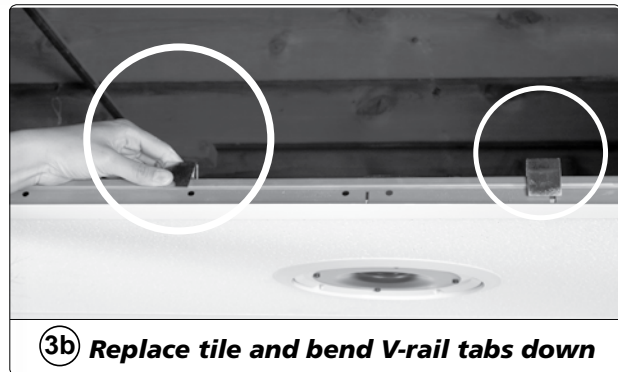
**TIP** Use a handheld screwdriver, as a powered screwdriver may slip and damage the speaker.

- f. Repeat steps a through e for each speaker that is to be installed.



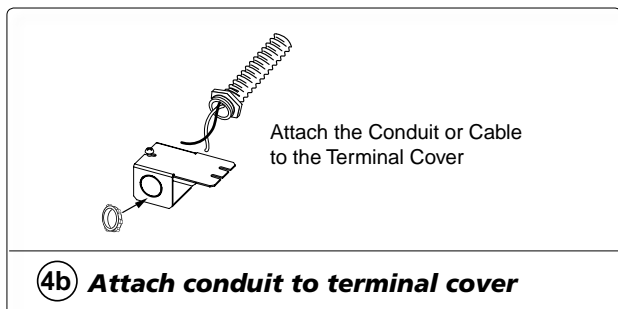
### 3. Secure speakers to structural ceiling

- a. Replace each tile and speaker on the T-bar frame
- b. Bend down the V-rail tabs to hold it in place and give added support.
- c. Drill a hole into the structural ceiling and install a lag eye bolt at a suitable location over the speaker.
- d. Attach a hanging wire to the speaker seismic tab.



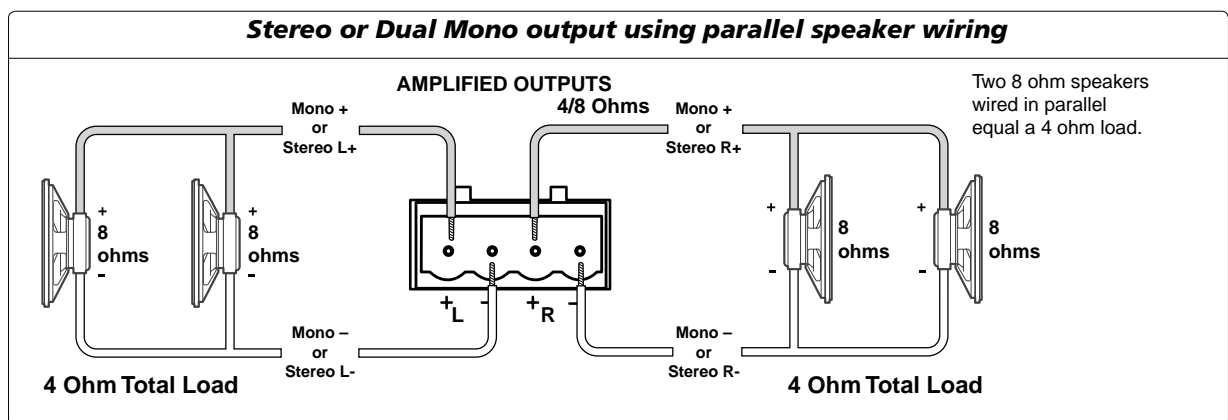
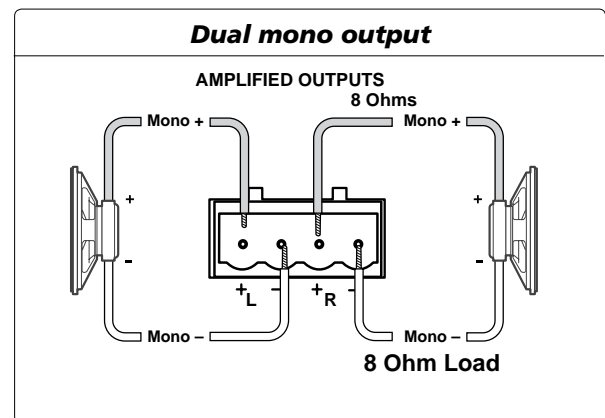
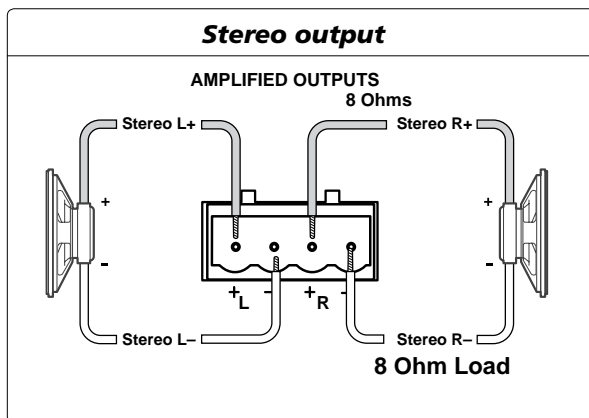
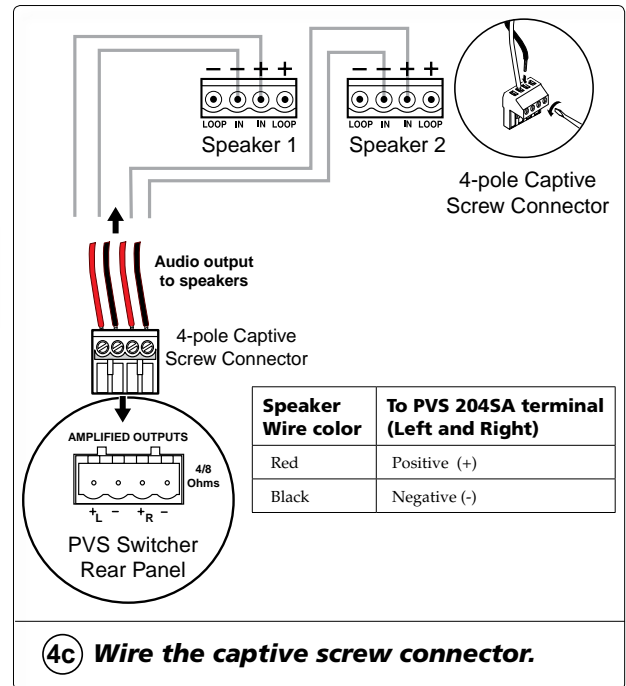
### 4. Cable the speakers

- a. Cut the included speaker cable (SPK 18) to length and run the cable from the PVS 204SA to the first speaker in the speaker system being installed.
- b. If not using conduit, insert a 1/2" clamp into the terminal (plenum) cover knockout and pass the cable through the knockout. Clamp the cable or conduit to the cover.



- c. To terminate the cable, strip the end of the cable 0.2" (5 mm) and secure the wires into the supplied 4-pole captive screw connector.
- d. Plug the 4-pole connector into the speaker terminal and replace and secure the plenum cover

**NOTE** The correct speaker impedance loading must be observed when setting up a speaker system. See figures below for examples.

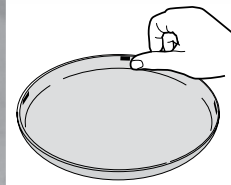
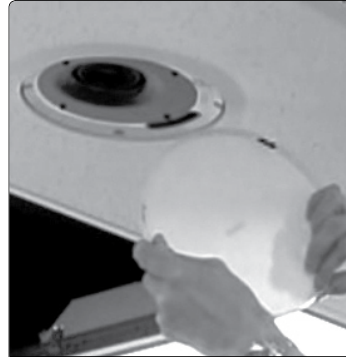


## Installation — Stage Three, cont'd

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### 5. Finish speaker installation

- a. Install/replace the speaker grill on the front of the speaker, using the supplied adhesive tabs (putty) to secure it in place.



Apply 4 pieces of black putty (supplied), equally spaced 90° apart, to the upper inside edge of the grille.

**5a Apply putty to speaker grill.**

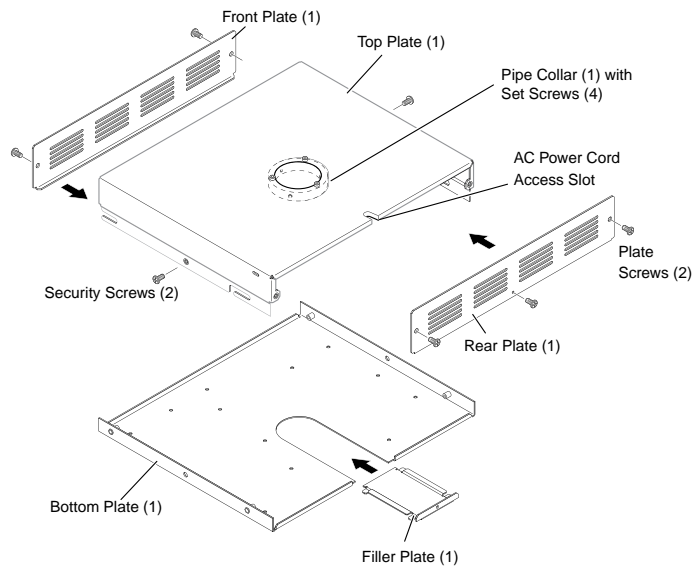
- b. Repeat cabling and final installation steps for all speakers, connecting the speakers according to the system preferred (e.g in parallel, see page 2-19)

## Stage Four — Install the PMK 450 and the PVS 204SA

# Stage 4

This stage covers installing the devices shown below.

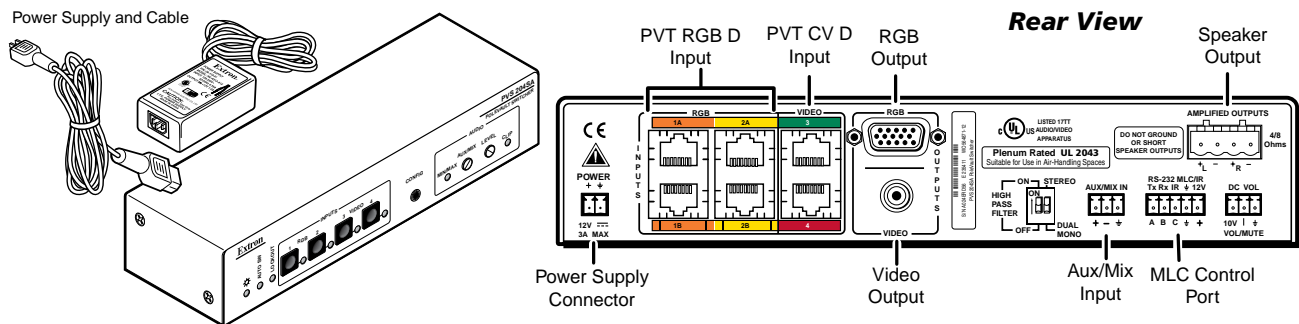
### PMK 450 Pole Mount Kit



**Where it goes:** Attaches to PMP around cable access hole, above the projector.

**What it does:** Supports and hides the installed PVS 204SA switcher, power supply, and any installed optional accessories.

### PVS 204SA PoleVault Switcher



**Where it goes:** PVS 204SA and power supply install on the base plate of the PMK 450.

**What it does:** Receives input video and audio signals from A/V source input wall plates, outputs and switches the signals to projector and ceiling speakers.

### Cables

VGA cable (connects to RGB output and projector)

RCA cable (connects to video output and projector)



MVGA M-M, 3'

V RCA, 3'

## Installation — Stage Four, cont'd

**NOTE** The installation must conform to national and local electrical codes, and UL requirements. Refer to the device's user manual for details.

### 1. Pull the cables

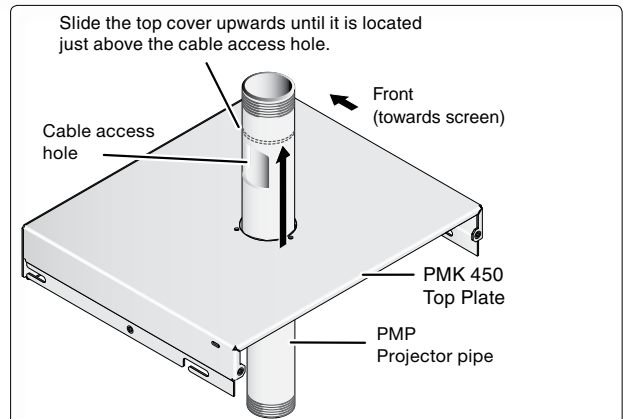
- a. Loosen the PCM 240 set screws and remove the PMP.
- b. Gather all the cables from the speakers, A/V wall plates, MLC 104 IP Plus controller, and any optional devices installed that have been run to the projector location, and pull them down through the hole in the ceiling tile. These cables are:
  - the MLC power/RS-232 cable,
  - the CAT 5 input cables from the wall plates,
  - the speaker cables,
  - the MLC to projector IR/Serial comms cable,
  - any optional device cables (e.g. PPC 25 sensor)
- c. Gather the cables together below the suspended ceiling and pass them down the PMP.
- d. Screw the PMP back up into position and tighten the set screws on the PCM 240.



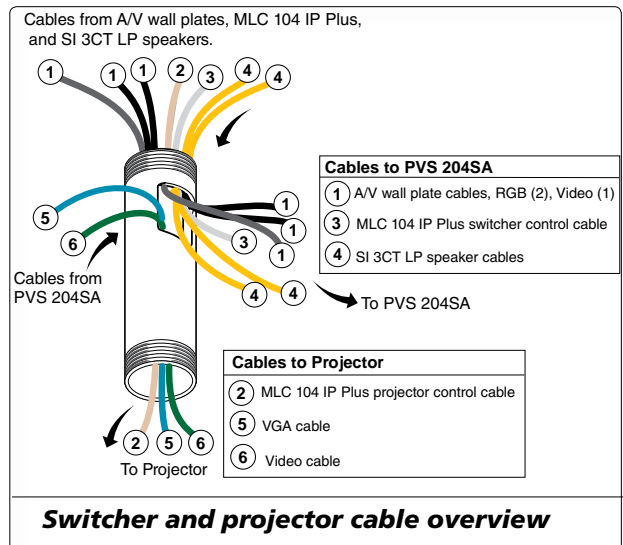
**1c** Gather the cables, pass them down the PMP and **1d** screw it into place.

### 2. Install the PMK 450 Pole Mount kit

- a. Remove the front and rear plates from the PMK 450, remove the side screws, and slide the top plate forward and away from the base plate lugs.
- b. Slide the PMK 450's top plate up the projector pole until it is located just above the cable access hole.
- c. Level the plate and secure it in place with the four set screws located on the collar, ensuring that a minimum of three set screws are tightened firmly against the pole. Rotate the pipe if necessary to achieve this.
- d. Pull the CAT 5 cables from the wall plates, the speaker's cable, and the MLC control cable through the access hole, ready for connection to the switcher. Leave the MLC to projector serial communications cable to hang out of the bottom of the pipe.
- e. Insert the output video signal cables (VGA and RCA) into the access hole and pull them down the pipe so one end hangs out the pipe with the MLC to projector communication cable. These cables connect to the projector later.



**2b** Slide the top plate up onto the pole

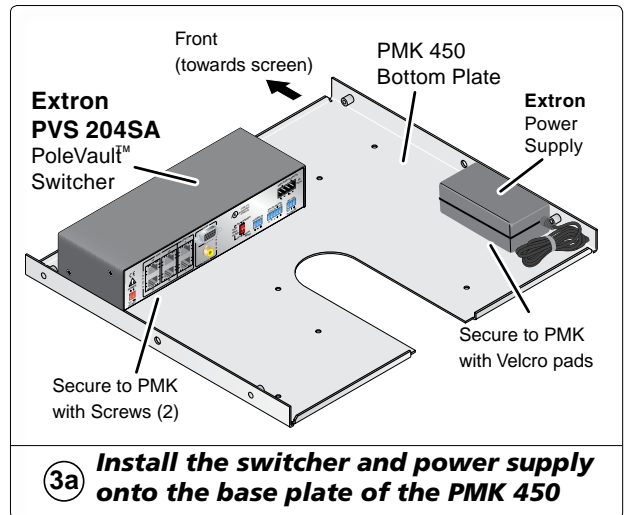


### 3. Install the PVS 204SA switcher

- a. Pass two 4-40 x 3/16" screws up through the PMK's bottom plate into the holes in the base of the switcher, and secure it in place at the left front of the bottom plate.

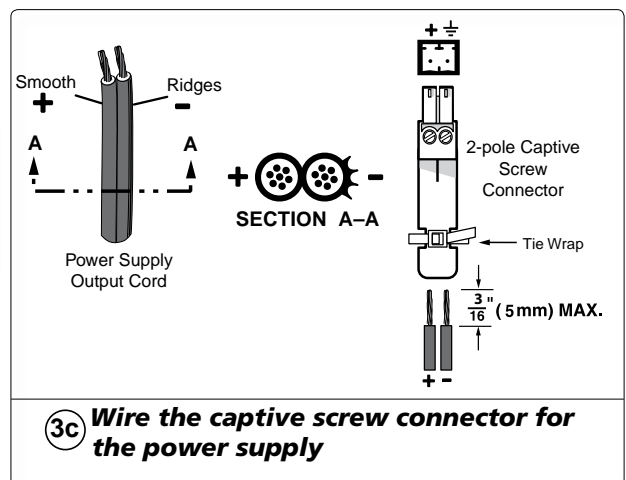
**NOTE** Do not install the rubber feet on the switcher when installing the device in the PMK.

- b. Install the power supply on the right rear of the PMK 450 bottom plate and secure it using velcro.

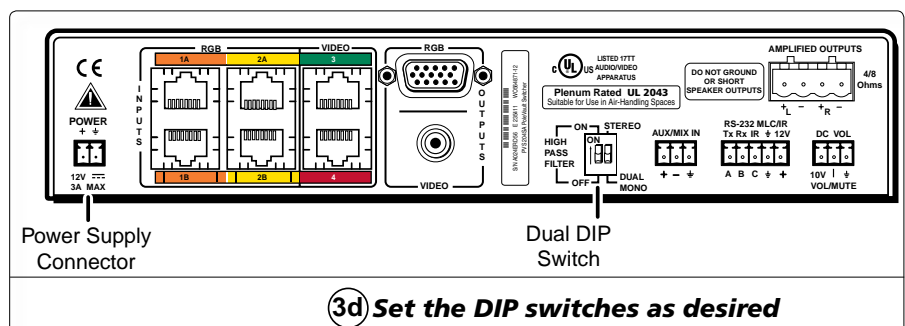


- c. Attach the supplied 2-pole male captive screw connector to the cord of the supplied power source and connect the power cord to the rear of switcher.

**TIP** Insert the extra captive screw connectors into any ports which are not going to be used at this time. This keeps the connectors handy for any future system modifications.



- d. Set the DIP switches on the rear panel of the PVS 204SA to Dual Mono and high pass filter off. Refer to the *PVS 204SA User's Manual* for details.



- e. Install any other optional devices, such as the Extron Priority Page Sensor Kit on the PMK 450, following the installation steps in the devices' user's manuals. See the "Optional Accessory Installation — PPC-25" section in this manual for an overview.

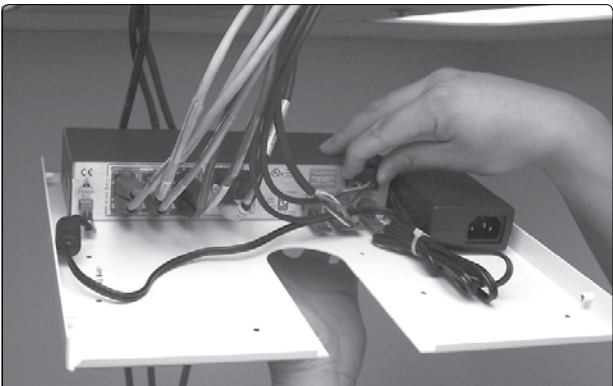


# Installation — Stage Four, cont'd

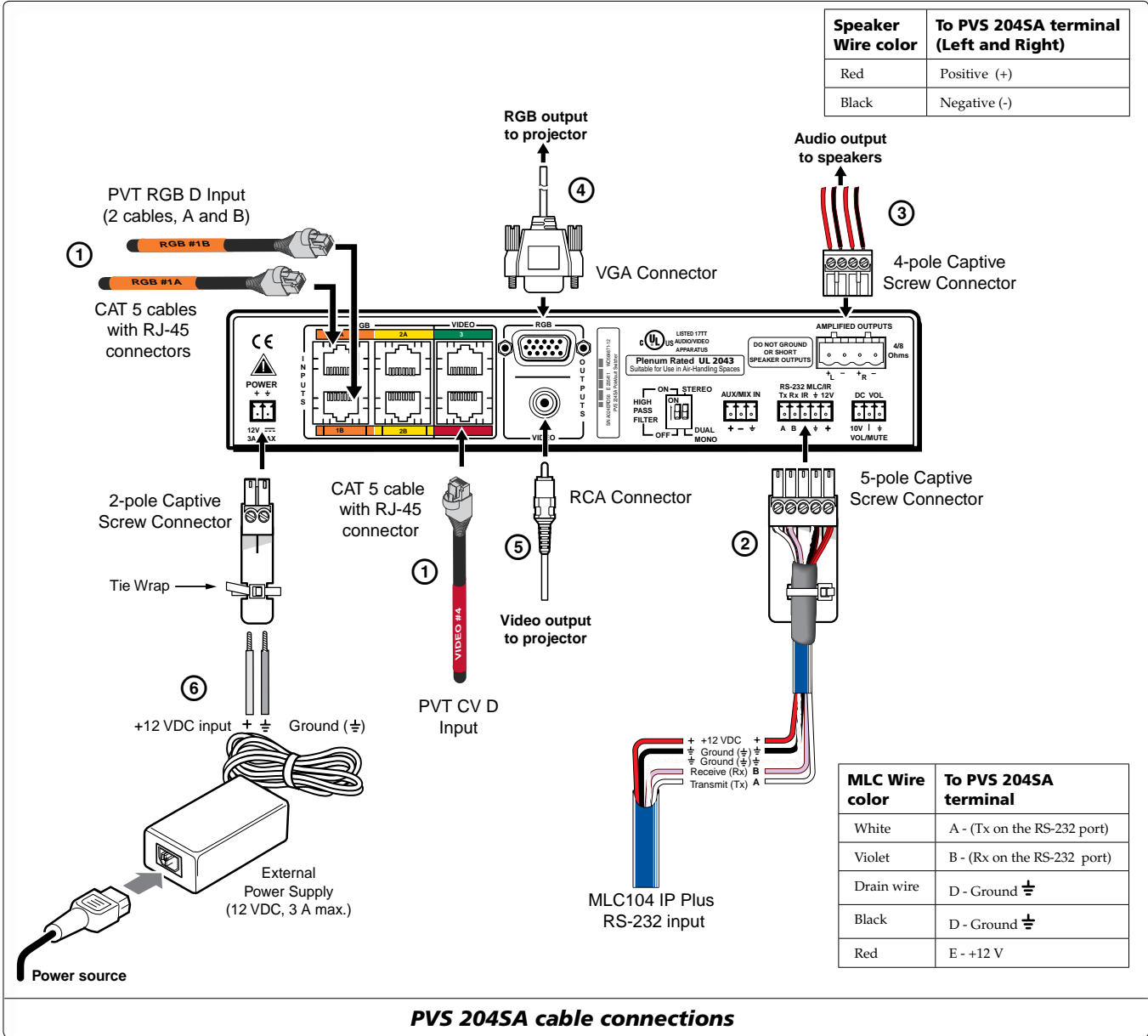
## 4. Finish installing the Pole Mount kit

- a. Lift the bottom plate (complete with the PVS 204SA and power supply installed) up to base of the pole and connect the cables as follows:
  - ① CAT 5 cables according to the cable labels
  - ② Control/power cable from the MLC 104 IP Plus
  - ③ Speaker cables
  - ④ VGA and ⑤ RCA cables
  - ⑥ Power supply cable. **Do not apply power yet.**

**NOTE** Do not thread the power cable through the projector pipe. Threading the power cable through the pipe violates national electrical regulations.

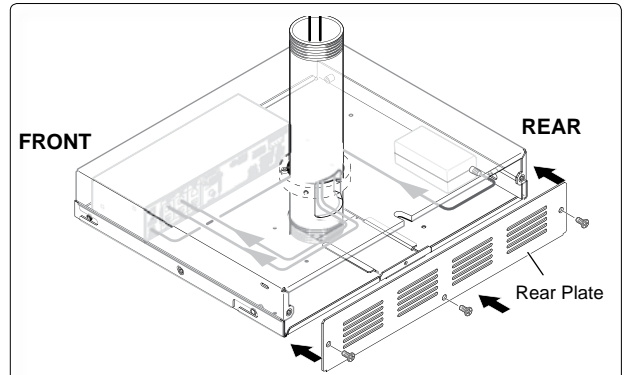


4a Connect the cables to the switcher



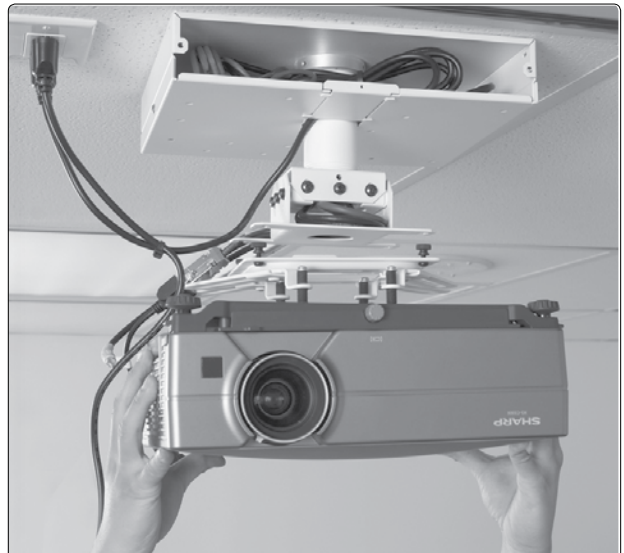


- b. Align the bottom plate lugs with the slots in the top plate and slide up and into place.
- c. Attach the rear plate to secure the PMK 450. Ensure the power cable exits via the cable notch in the top plate, or via the gap in front of the filler plate at the bottom.



**4c Attach and screw down rear plate**

- d. Screw the UPB 25 adjuster plate back onto the base of the PMP, and replace the projector (with the UPB 25 bracket attached) on the adjuster plate.
- e. Connect the switchers VGA and RCA cables to the projector.
- f. Connect the projector control cable from the MLC to the projector. Refer to the projector's user manual for RS-232 control port pinout details.



**4d Replace projector on the adjuster plate**

## Stage Five — Configure the System

# Stage 5

Items needed to help complete this stage:

- Laptop (or PC) with a network connection
- GC 2 configuration program (download from [www.extron.com](http://www.extron.com))
- *MLC 104 IP Plus User's Manual*
- Projector manufacturer's user's manual
- Device driver and/or driver package (download from [www.extron.com](http://www.extron.com))

### 1. Configure the system

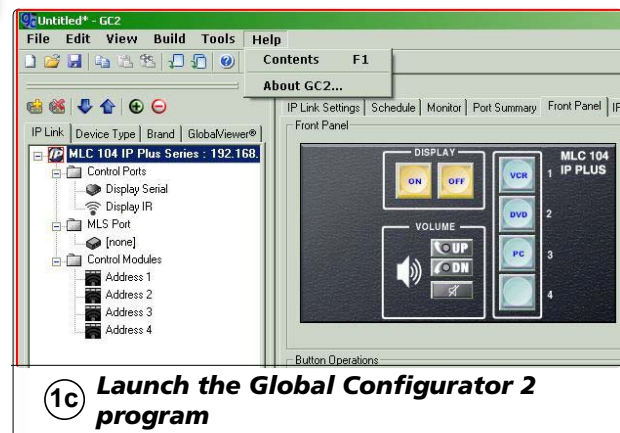
- a. Download and install Extron's Global Configurator (GC2) configuration program (available at [www.extron.com](http://www.extron.com)) on the laptop or PC



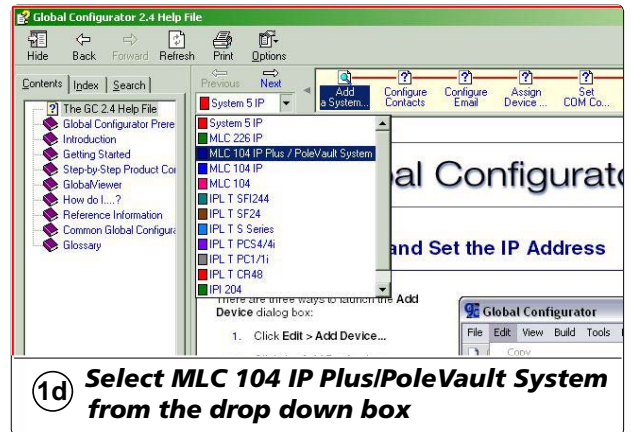
- b. Ensure the laptop (or PC), and the MLC 104 IP Plus are connected to the LAN.

**NOTE** *If this is not possible, connect a 2.5 mm TRS configuration cable (part # 70-355-01) to the laptop (or PC) and to the front panel configuration port of the MLC 104 IP Plus.*

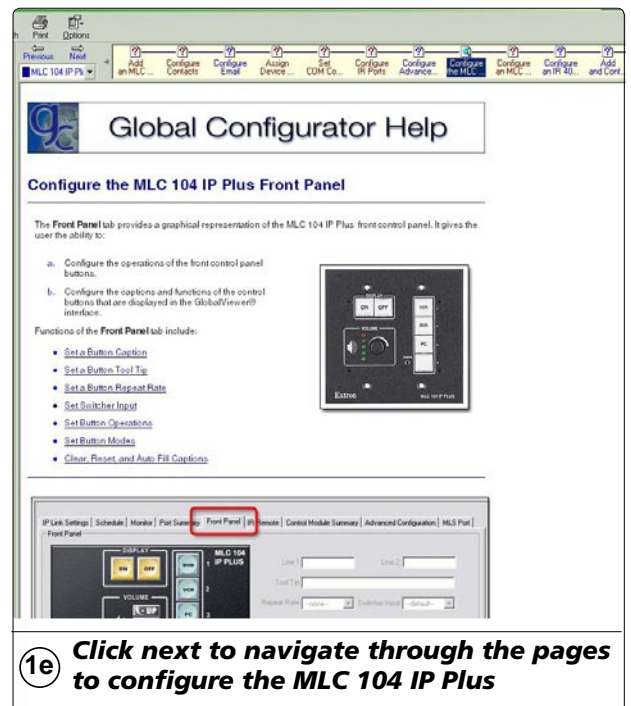
- c. Launch GC2. Click on Help, then Contents (or press F1).



- d. Select the MLC 104 IP Plus/PoleVault system from the drop-down box. Follow the instructions on the help page.



- e. To move to the next page (shown in the yellow box), click the NEXT button above the drop-down box. Repeat as needed, following the instructions on the pages to configure the MLC 104 IP Plus, as needed.



## Installation — Stage Five, cont'd

### 2. Test the system

- a. Ensure power is supplied to the PVS 204SA switcher, and power on the MLC 104 IP Plus.



**2a Turn on the MLC 104 IP Plus controller and the PVS 204Sa switcher**

- b. Connect all the input devices (e.g., PC, DVD, document camera, etc.) to the transmitters and power up the input devices. Check that power and signal are present at the transmitters. The LEDs light red when only power is present and light green when power and a signal are present.

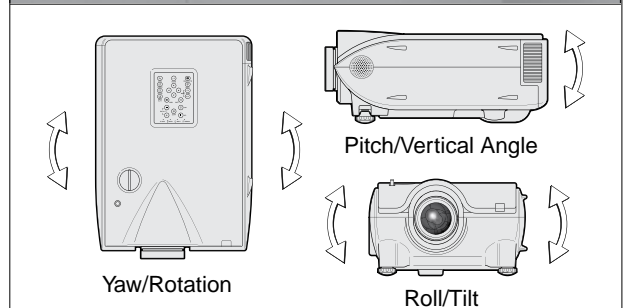
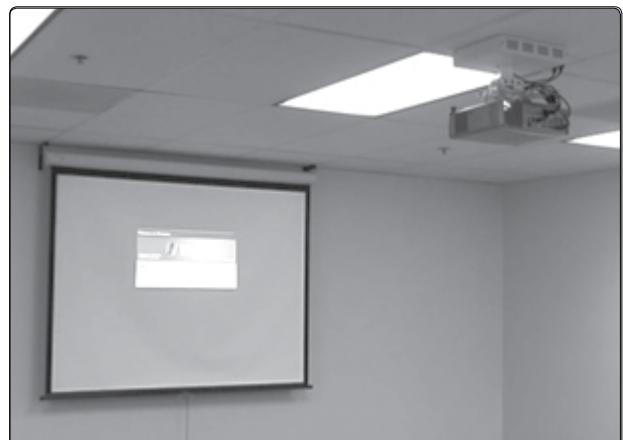


**2b Connect and turn on the input devices**

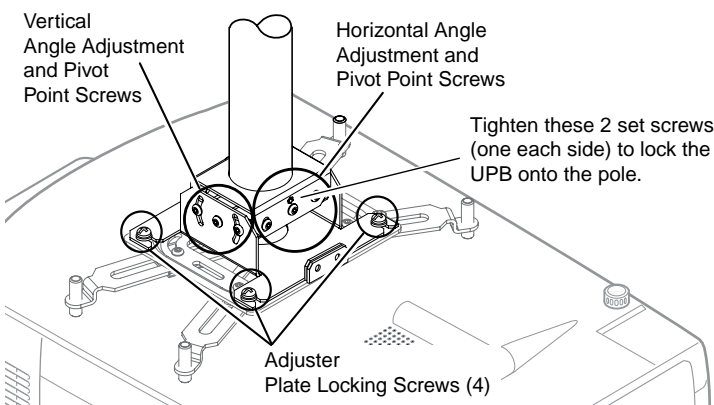
- c. Power on the projector and with a video source (PC or DVD playing) check that a good image is shown on screen.

Adjust projector settings as follows:

- Adjust the rotation (**yaw**) by turning the unit on the projector pole. Secure the location by tightening the two set screws on the UPB mount plate to the pole (see below).
- Loosen all pivot screws and adjust the vertical angle (**pitch**) of the projector. Lock down the four adjustment screws.
- Adjust the horizontal tilt (**roll**) of the projector. Lock down all the remaining adjustment and pivot screws.
- Adjust the image settings on the projector (zoom, focus, keystone, brightness, contrast, etc.). Refer to the manufacturer's user manual.



**2c Check that an image is present, adjust as needed.**



d. Test the controller's configuration with the following:

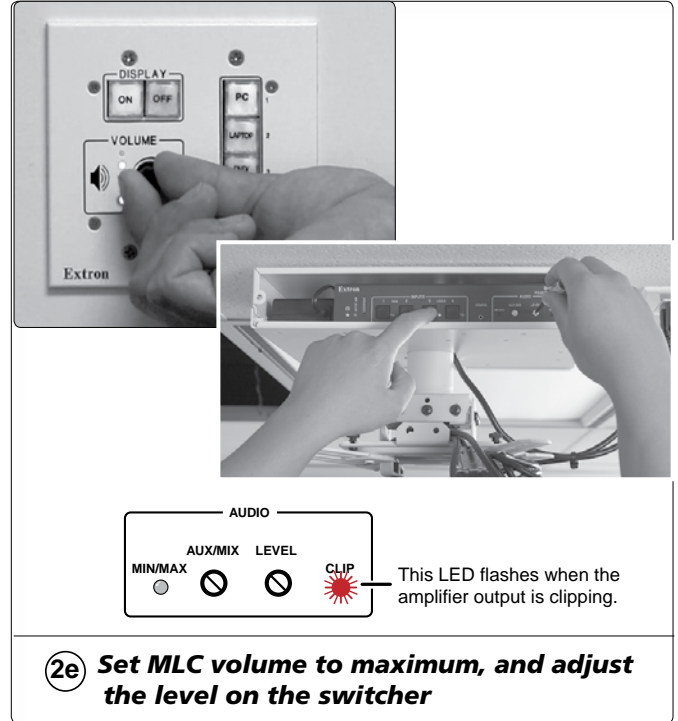
- Check that the MLC is controlling the PVS 204SA switcher and projector, and does output the correct image when switching inputs.
- Check the projector's power control (turn it off and on at the MLC controller).
- Adjust the configuration as necessary.

e. Adjust the audio input sensitivity as follows:

- Ensure there is an audio source at each transmitter.
- Set the MLC controller's volume to maximum.
- On the PVS 204SA switcher, press and hold the selected input buttons for 3 seconds. The input's LED will blink.
- While holding the input button in, rotate the level encoder until the clip LED blinks, then turn the encoder back down until the blinking stops.
- Repeat Step e for all inputs.

f. If necessary adjust the amplifier level by rotating the same encoder used in Step e.

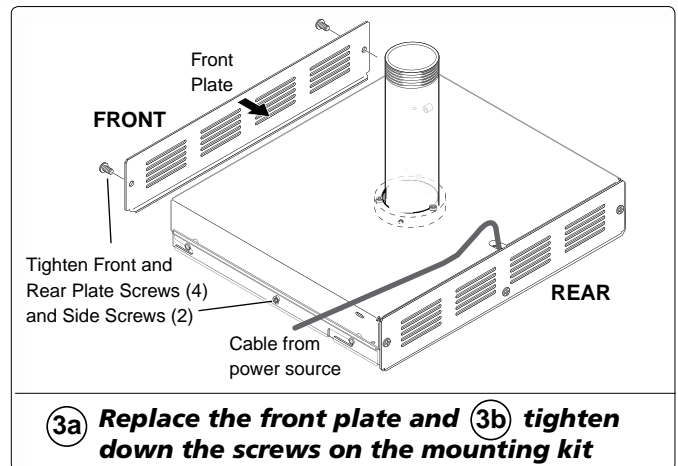
g. If necessary set the Aux/Mix level by rotating the Aux/Mix encoder.



### 3. Final installation

a. Replace the front plate of the PMK 450. The power cable exits the unit through the power cable access slot at the rear.

b. Tighten down all six screws on the PMK 450, four on the front and rear plates, and two on the sides.



c. Check and tighten the adjuster plate locking screws on the projector bracket.

# Optional Accessory Installation — PPC 25

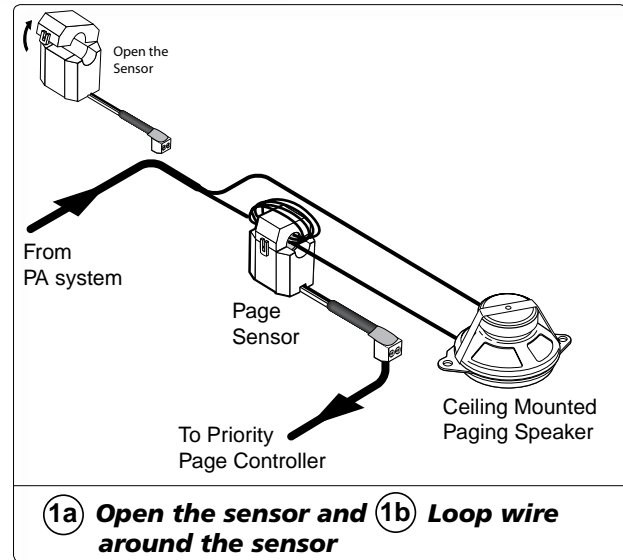
The example below is the installation of the optional accessory Priority Page Controller and Sensor (PPC 25). The Priority Page Controller momentarily silences classroom audio whenever a page is made from a public address (PA) system.

For detailed information, refer to the *PPC 25 Installation Instructions*, supplied with the device.

**NOTE** Follow all local fire and safety code requirements for installation and anchoring.

## 1. Connect sensor to paging speaker

- Open the top of the Priority Page Sensor.
- Loop (only) one of the Paging speaker wire leads around the top (open) part of the Sensor. Either speaker wire will work. Leave the other speaker wire connected directly to the Paging speaker. Polarity need not be observed.
  - For a 25 V or 70V system — wrap 5 to 8 loops.
  - For a 4/8 ohm system — wrap 2 to 4 loops.
- Close the top of the Priority Page Sensor.

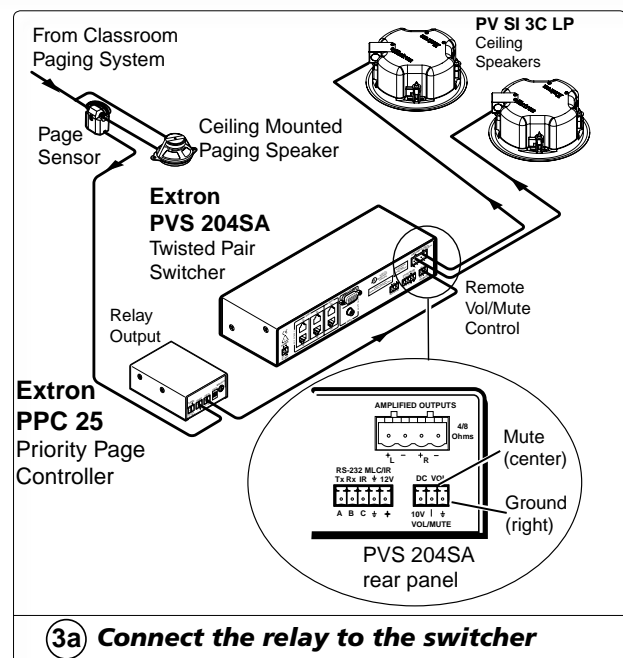


## 2. Connect sensor to the PPC 25

- Cut an 18" section from the unterminated end of the supplied blue sensor cable, for use in step 3.
- Connect the bare wire end of the supplied blue sensor cable to the 2-pole captive screw connector on the Page Sensor. Polarity need not be observed.
- Route the connector end of the sensor cable to the PPC 25 Controller and plug it into the Paging Sensor port.

## 3. Connect the PPC 25 to the switcher

- Connect the 18" cable made in step 2a to the Relay Out port on the PPC 25 Controller and to the mute and ground pins on the PVS 204SA Vol/Mute port. Polarity need not be observed.
- Use the included power supply cable assembly (PN 27-576-01LF) to power the PPC 25 from the PVS 204SA power supply. The PPC 25 must be mounted near the PVS 204SA and its power supply.





# Installation — Reference Information

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## Specifications

For detailed specifications and warranty information of the PoleVault System components, refer to the device manuals, or the product pages at [www.extron.com](http://www.extron.com).

### Mounting hardware

#### PCM 240

Mounting.....	Drop ceiling mount
Enclosure type .....	14 gauge steel/powder coated white
Plate dimensions .....	25.8" L x 8.0" W x 1.2" D (65.5 cm L x 20.3 cm W x 3.0 cm D)
Product weight .....	5.6 lbs (2.5 kg)
Listings.....	UL, CUL as an accessory, for use with UL Listed mount and projector
Compliances.....	CE, OSHPD anchorage pre-approval
Vibration.....	ISTA 1A in carton (International Safe Transit Association)

#### PMP 6

Material.....	Steel Pipe
Color/finishes.....	White or black powder coat
Pipe dimensions .....	6" length, 1.5"-11.5 NPT threads)
Product weight .....	1.0 lbs (0.5 kg)
Listings.....	UL, CUL as an accessory, for use with UL Listed mount and projector
Compliances.....	CE
Vibration.....	ISTA 1A in carton (International Safe Transit Association)

#### PMK 450

Mounting.....	Mountable to round projector mount pipes with an outer diameter of 1.85" to 1.95" (4.7 cm to 5.0 cm) using included hardware
Maximum load .....	15 lbs (6.8 kg)
Enclosure type (material) .....	Metal
Enclosure dimensions.....	2.32" H x 12.25" W x 11.63" D (5.9 cm H x 31.1 cm W x 29.5 cm D)
Product weight .....	2.4 lbs (1.2 kg)
Listings.....	UL, CUL
Compliances.....	CE
Vibration.....	ISTA 1A in carton (International Safe Transit Association)

#### UPB 25

Material.....	Steel
General dimensions .....	Refer to UPB 25 Manual
Product weight .....	3.7 lbs (1.7 kg)
Maximum capacity .....	25 lbs (11.3 kg)
Listing .....	UL, CUL as an accessory, for use with UL Listed mount and projector
Compliances.....	CE
Vibration.....	ISTA 1A in carton (International Safe Transit Association)

**NOTE** Specifications are subject to change without notice.

## Installation — Reference Information, cont'd

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### Devices

#### PVS 204SA

External power supply .....	100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 3 A, regulated
Power input requirements .....	12 VDC, 0.97 A (typical)
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Enclosure type .....	Metal
Enclosure dimensions .....	1.7" H x 8.7" W x 3.0" D (1U high, half rack wide) (4.3 cm H x 22.1 cm W x 7.6 cm D)
Product weight .....	2.5 lbs (1.1 kg), plus power supply 0.8 lbs (0.4 kg)
Vibration .....	ISTA 1A in carton (International Safe Transit Association)
Listings.....	UL, CUL, (UL rated for use in plenum airspaces: meets UL 2043 for heat and smoke release, excluding the power supply; meets UL 60065 for safety)
Compliances.....	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF.....	30,000 hours

#### MLC 104 IP Plus

Power .....	Supplied by the PVS 204SA twisted pair receiver/switcher
Power input requirements .....	12 VDC, 0.19 A (0.305 A if used with an optional IRCM-DV+)
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount .....	Wall and furniture mountable
Enclosure type .....	Metal
Enclosure dimensions.....	MLC 104 IP Plus faceplate 4.5" H x 4.6" W x 0.1" D (11.4 cm H x 11.7 cm W x 0.3 cm D) MLC 104 IP Plus device 2.7" H x 3.4" W x 1.8" D (6.9 cm H x 8.6 cm W x 4.6 cm D) (Depth excludes knob and buttons. Fits some 2 gang boxes. Allow at least 1.9" [4.8 cm] depth in the wall or furniture.)
Product weight .....	1.9 lbs (0.9 kg)
Vibration .....	ISTA 1A in carton (International Safe Transit Association)
Listings.....	UL, CUL
Compliances.....	CE, FCC Class A, VCCI, AS/NZS, ICES, Section 508 of the Rehabilitation Act (29 U.S.C. 794d)
MTBF.....	30,000 hours

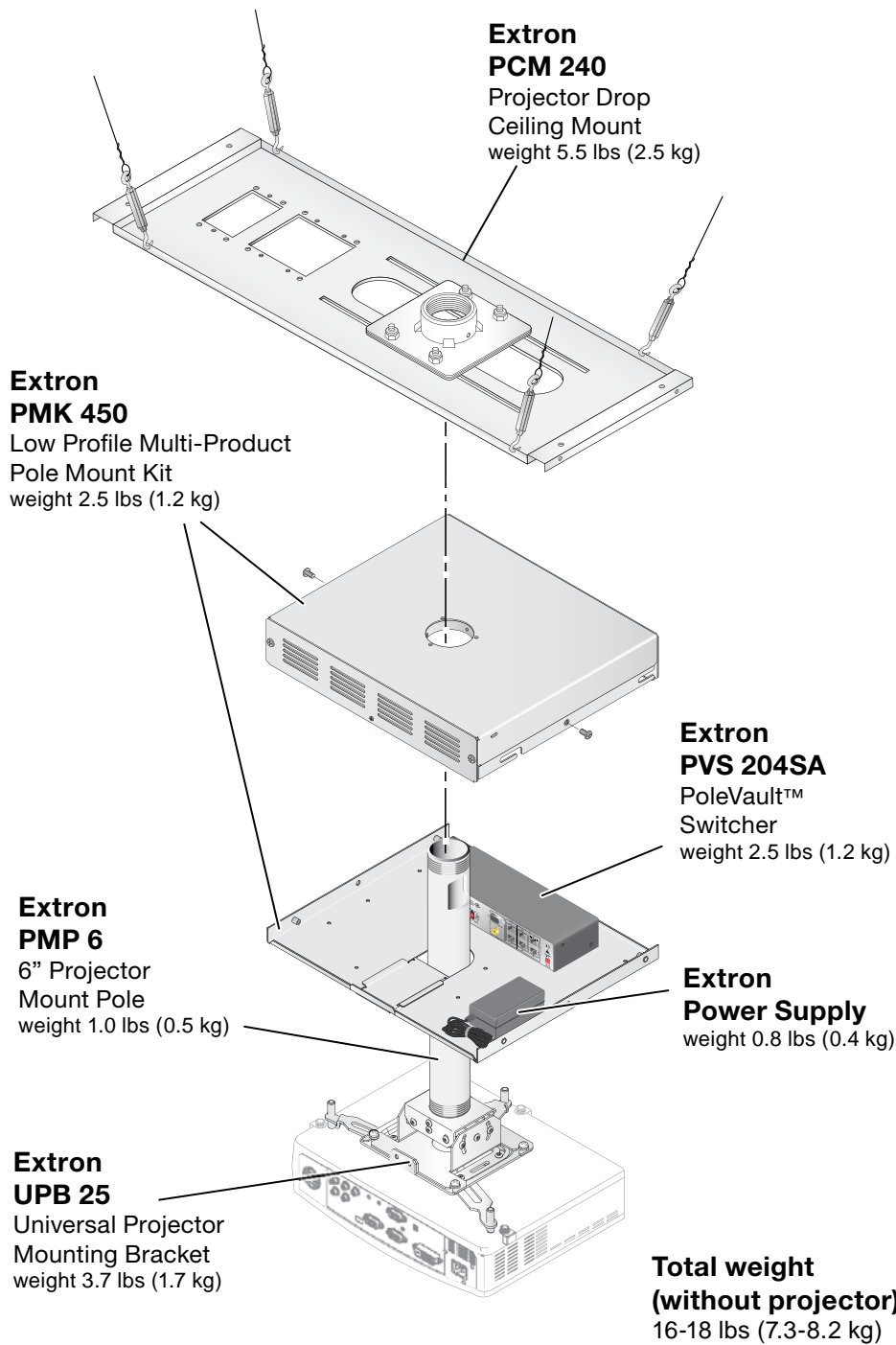
#### PVT CV D and PVT RGB D

Power .....	Supplied by the PVS 204SA twisted pair receiver/switcher
Power input requirements .....	5 VDC, 0.10 A for PVT CV D; 5 VDC, 0.15 A for PVT RGB D
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Mount.....	Wall or furniture mountable with included Decora wall plate.
Enclosure type .....	Metal
Enclosure dimensions.....	Faceplate 2.6" H x 1.3" W x 0.3" D (6.6 cm H x 3.3 cm W x 0.7 cm D) (fits the opening in a 1 gang Decora plate) Device 2.6" H x 1.6" W x 0.7" D (6.6 cm H x 4.1 cm W x 1.8 cm D) (Depth excludes connectors, height excludes mounting tabs.)
Product weight.....	0.2 lbs (0.1 kg)
Vibration.....	ISTA 1A in carton (International Safe Transit Association)
Listings.....	UL, CUL
Compliances.....	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF.....	30,000 hours

**NOTE** All nominal levels are at  $\pm 10\%$

**NOTE** Specifications are subject to change without notice.





**Ceiling mount installation diagram (with item weights) for PoleVault System**

## Outline of installation steps

### Stage One — Install the Screen and Projector.

- ☐ Mark the screen location (page 2-3).
- ☐ Install projector to verify location (page 2-3).
- ☐ Verify the image location (page 2-4).
- ☐ Cut the ceiling tile (page 2-5).
- ☐ Finish projector ceiling mount installation (page 2-5).
- ☐ Secure the projector ceiling mount to the ceiling (page 2-6).
- ☐ Install the screen (page 2-7).

### Stage Two — Install the A/V Source Input wall plates and MLC 104 IP Plus.

- ☐ Install the mud rings (page 2-10).
- ☐ Pull cables (page 2-11).
- ☐ Install the wall plates (page 2-12).
- ☐ Install the MediaLink Controller (page 2-13).

### Stage Three — Install the PV SI 3C LP Ceiling Speakers.

- ☐ Cut the ceiling tile (page 2-17).
- ☐ Install the speaker in the ceiling tile (page 2-17).
- ☐ Secure the speakers to the structural ceiling (page 2-18).
- ☐ Cable the speakers (page 2-18).
- ☐ Finish speaker installation (page 2-20).

### Stage Four — Install the PMK 450 and the PVS 204SA.

- ☐ Pull the cables (page 2-22).
- ☐ Install the PMK 450 pole mount kit (page 2-22).
- ☐ Install the PVS 204SA switcher (page 2-23).
- ☐ Finish installing the pole mount kit (page 2-24).

### Stage Five — Configuring the system.

- ☐ Configure the system (page 2-26).
- ☐ Test the system (page 2-28).
- ☐ Final installation (page 2-29).

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